ERDC/CHL TR-03-11

Coastal and Hydraulics Laboratory

US Army Corps
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Final report



Prepared for U.S. Army Engineer District, Mobile
Mobile, AL

**ABSTRACT:** The Tom Bevill Lock and Dam is approximately 1 mile southwest of Pickensville in Pickens County, AL. The lock is located on the left overbank about 332.7 river miles above the mouth of the Mobile River and is designed to maintain a minimum upper pool extending upstream to river mile 342.2 during low flows. The lock is 110 ft by 600 ft clear chamber dimensions. The dam consists of a gated spillway in the river channel and an adjacent 150-ft overflow weir on the right overbank. The lock is connected to the dam with a 150-ft abutment wall. A strong crosscurrent or outdraft existing in and around the upstream lock entrance causes difficulty for tow traffic navigating the lock. The purpose of the model study is to suggest possible solutions to improve and/or correct the outdraft for the approach of tows.

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# Preface

This navigation study was performed by the U.S. Army Engineer Research and Development Center (ERDC), Coastal and Hydraulics Laboratory (CHL) for the U.S. Army Engineer District, Mobile. The study was performed during the period June 2002 through March 2003 at ERDC.

The Principal Investigator for the physical model study was Mr. Michael F. Winkler, research hydraulic engineer, Navigation Branch, CHL, who was assisted by Mr. Howard Park, also of the Navigation Branch, CHL. Technical assistance was provided by Messrs. Danny Marshall, Keith Green, and Mme. Peggy Van Norman and Karen Anderson-Smith, all of the Navigation Branch, CHL. The report was written by Mr. Winkler.

The work was conducted under the administrative supervision of Mr. Thomas W. Richardson and Dr. William D. Martin, Director and Deputy Director, respectively, CHL, and under the direct supervision of Mr. Don Wilson, Chief, Navigation Branch.

Dr. James R. Houston was Director of ERDC, and COL James R. Rowan, EN, was Commander and Executive Director.

# Conversion Factors, Non-SI to SI Units of Measurement

Non-SI units of measurement used in this report can be converted to SI units as follows:

| Multiply | By | To Obtain |
|---|---|---|
| acres | 4,046.873 | square meters |
| acre-feet | 1,233.489 | cubic meters |
| cubic feet | 0.02831685 | cubic meters |
| feet | 0.3048 | meters |
| miles (US statute) | 1.609347 | kilometers |

# 1 Introduction

## Location and Description of Prototype

The Tom Bevill Lock and Dam is located on the Tombigbee River approximately 1 mile[1] southwest of the town of Pickensville in Pickens County, AL (Figure 1). The lock was constructed on the left overbank of the river approximately 332.7 river miles above the Mobile River mouth. It is designed to maintain a minimum upper pool at elevation 420.6[2] extending upstream to river mile 342.2 during low flows. The Tom Bevill Lock and Dam project consists of a nonoverflow dike located on the left descending bank to connect the lock to high ground; 110-ft-wide by 600-ft-long lock with a maximum lift of 27-feet; a concrete abutment wall connects the lock to the dam and spillway. The dam consists of a gated spillway in the river channel, and an adjacent 150-ft fixed-crest overflow weir.

## Project History

Tom Bevill Lock and Dam is the second navigation structure on the Tennessee-Tombigbee Waterway above Demopolis Lock and Dam. Demopolis Lock and Dam is located on the Tombigbee River just below the confluence with the Black Warrior River. The existing project was authorized by the River and Harbor Act of July 24, 1946 (H. Doc. 486, 79th Cong., 2nd sess.). The Energy and Water Development Appropriation Act of 1988 (100th Cong, 1st sess., December 22, 1988) authorized changing the name of the project from Aliceville Lock and Dam to Tom Bevill Lock and Dam. Initial construction at the project began in March 1974 and the lower pool was turned into the lock during October 1978. The upper pool reached normal level (el 136.0) on 30 December 1979. The 27.9-mile-long reservoir has an area of 8,300 acres and a total volume of 60,400 acre-feet at normal pool. The normal upper pool is maintained at el 136.0 and the minimum lower pool is maintained at el 109.0. At the Tom Bevill site the river is about 200 ft wide with banks 25 ft high.

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[1] A table of factors for converting SI to non-SI units of measurement is presented on page vi.

[2] All elevations (el) cited herein are referenced to the National Geodetic Vertical Datum (NGVD) ( to convert feet to meters, multiply number of feet by 0.3048).

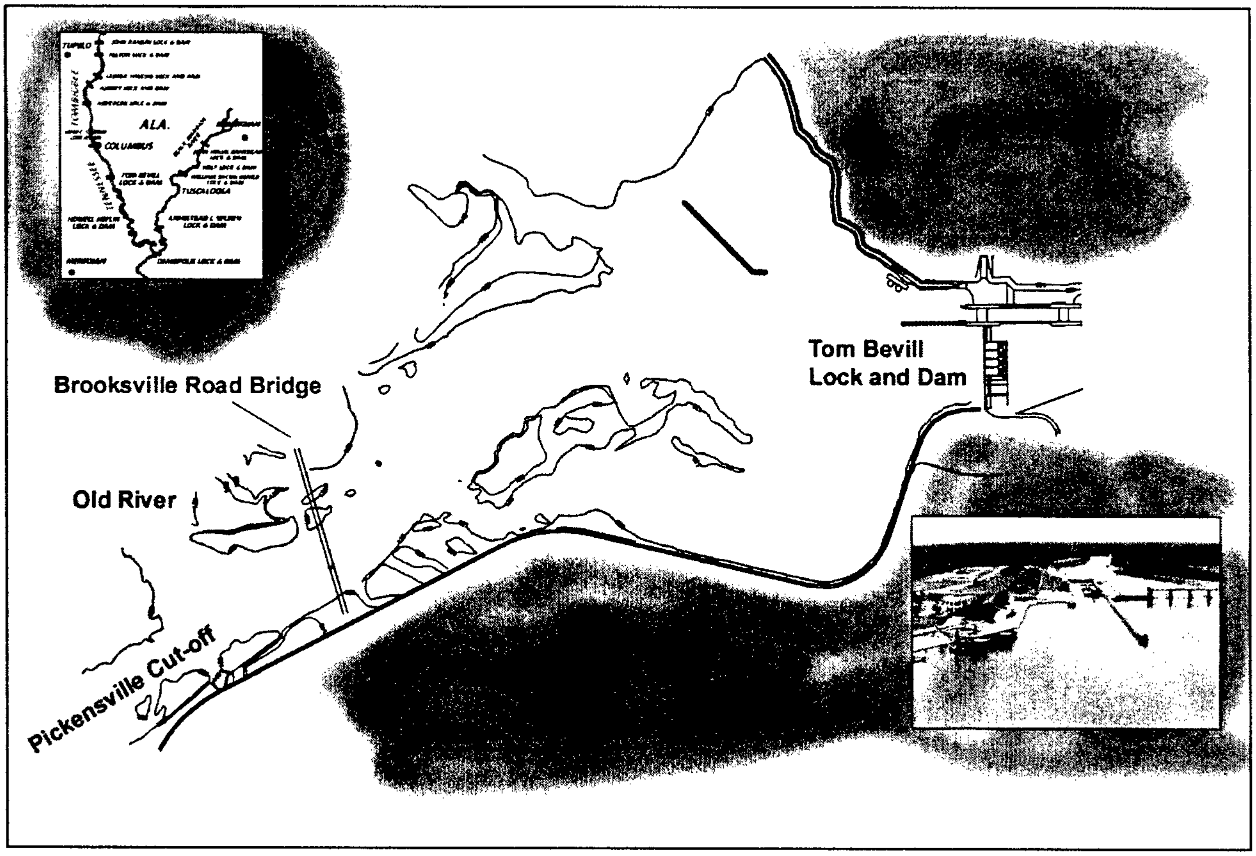


Figure 1. Location map

## Purpose of Study

In the prototype, a strong crosscurrent, or outdraft, exists in and around the area of the upstream lock entrance, Figure 2. This condition causes difficulty navigating the lock for the existing commercial tow traffic. For downbound traffic, the problem is a tendency for the stern of the tow to swing towards the dam after the barges are within the influence of the guard wall. Upbound traffic experiences the same swing on the front of the barges as the tows exit the lock. Once the upbound tow is clear of the guard wall the current tends to align the tow/barges with the outdraft, but the effect is not as pronounced as that on downbound tows. A previous study of the outdraft was performed at ERDC in 1999.[1] Numerous designs were evaluated, however none of these were palatable to the sponsor. The purpose of this model study was to evaluate alternative solutions previously unavailable to improve and/or correct the outdraft.

[1] Lynch, G. C. (2001). "Outdraft at lock approach, Tom Bevill Lock and Dam, Alabama," ERDC/CHL TR-01-4, U.S. Army Engineer Research and Development Center, vicksburg, MS.

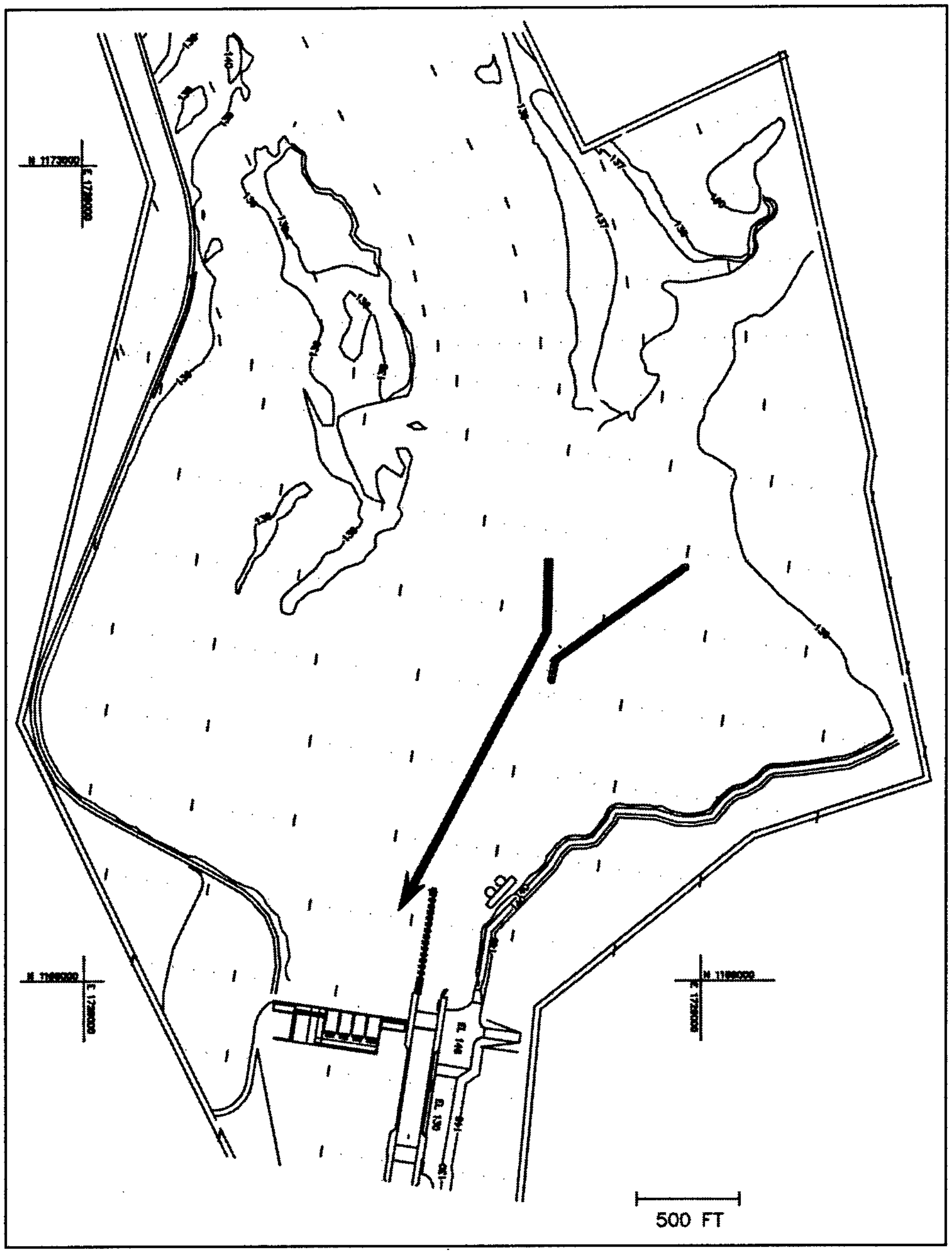


Figure 2. General direction of outdraft

# 2 Physical Model

## Description

The Tom Bevill Lock and Dam model reproduces approximately 1.9 miles of river channel and adjacent overbank from river mile 306.5 to river mile 308.4. The study area includes 1.6 miles of river upstream of the lock and dam and 2,400 ft downstream of the structure. The adjacent overbank areas would contain river flows to el 138.0 ft (NGVD). The model was of the fixed-bed type and the channel and overbank were constructed of sand and cement mortar. This mixture is molded to sheet metal templates cut to match the contours of the area, and then set to the proper grade. The physical model was molded to July 1997 hydrographic survey data obtained from the U.S. Army Engineer District, Mobile. A Plexiglas pier emulates the Alabama State Highway 86 bridge upstream of the project near the confluence of the original river channel and a cutoff channel. The straightened cutoff channel was constructed to facilitate tow alignment through the navigation span of the bridge. This pier is the only part of the bridge included in the model because it is the only part of the structure that affects navigation. The model study area is shown in Figures 2 and 3. The lock, ported guard wall, guide wall, and dam were constructed of sheet metal and Plexiglas, placed into the model, set to the proper grade, and cemented into place.

## Scale Relations

The model was built to an undistorted linear scale of 1:100, model to prototype. This scale allows for accurate reproduction of velocities, eddies, and crosscurrents that affect navigation. The following tabulation shows scale ratios resulting from 1:100 model to prototype.

| Dimension | Ratio | Scale Relations Model:Prototype |
|---|---|---|
| Length | $L_r$ | 1:100 |
| Area | $A_r = L_r^2$ | 1:10,000 |
| Velocity | $V_r = L_r^{1/2}$ | 1:10 |
| Time | $T_r = L_r^{1/2}$ | 1:10 |
| Discharge | $Q_r = L_r^{5/2}$ | 1:100,000 |
| Roughness (Manning's n) | $n_r = L_r^{1/6}$ | 1:2.15 |
| All dimensions are in terms of length L. | | |

Measurements of discharge, current velocities, and water-surface elevations are quantitatively transferred from model to prototype by means of these scalar relations.

## Appurtenances

Water was supplied to the model with a 10-cfs pump, which operated in a recirculating system. The discharge into the model at the Tombigbee River (Old River) and the Pickensville Cut-Off was regulated by control valves and measured with a Venturi meter. Water-surface elevations were measured in the model with piezometer gauges connected to a centrally located gauge pit. The upper pool elevation was controlled with a gated dam and the tailwater elevation was maintained with a tailgate at the lower end of the model.

Current magnitudes and directions were determined with cylindrical floats drafted to the depth of a loaded barge (9.0 ft-prototype). Surface current directions were observed in the model using confetti, which is influenced by the surface tension of the water. Dye placed in the model produces a plume that shows bottom current patterns as well as currents in the water column. A remote-controlled model towboat was used to determine the effects of currents on tows entering and leaving the upper lock approach. The towboat was propelled with twin screws operating independently of each other, each powered by small electric motors using a single battery. The towboat could be operated in forward and reverse and at scale speeds comparable to those using the Tombigbee River.

## Model Validation

With existing conditions, i.e., the lock and dam in place, the model was verified to the prototype. Towboat pilots from companies navigating Tom Bevill Lock and Dam validated that the model configuration represented the prototype with a reasonable degree of accuracy. The model was also validated with data acquired in the prototype. As part of the Monitoring of Completed Projects (MCNP) program, floats instrumented with GPS receivers were placed in the prototype upper pool and tracked to establish current direction patterns. Floats were tracked with a river discharge of approximately 40,000 cfs. The data tracks from the GPS units were compared to the model data of existing conditions. In addition to the float tracking data collection, tows navigating the Tom Bevill lock were also instrumented with GPS units and tracked in the upper pool as they entered and exited the lock. The data from the tows in the prototype were used to assist in model validation. Winkler and Wooley (2002)[1] describe how float and tow data were acquired at Tom Bevill Lock and Dam.

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[1] Winkler, M. F., and Wooley, R. T. (2002). "Current direction and velocity measurements using GPS receivers mounted on floats at Tom Bevill lock and dam," ERDC/CHL CHETN-IX-11, U.S. Army Engineer Research and Development Center, Vicksburg, MS.

# 3 Tests and Results

The study of flow patterns, measurement of current magnitudes and directions, and the effects of currents on the model tow were the primary concerns during this phase of the study. These concerns were addressed for existing conditions and for various alternatives investigated for the project.

## Test Procedures

Representative selections of river flows were used for testing based on information provided by the Mobile District. The following tabulation lists the river flows that were used.

| Total River Discharge, cfs | Upper Pool Elevation, ft | Lower Pool Elevation, ft |
|---|---|---|
| 20,000 | 136.0 | 118.4 |
| 32,500 | 136.0 | 126.0 |
| 45,000 | 136.0 | 131.6 |
| 57,500 | 138.0 | 136.4 |
| 70,000 | 141.2 | 139.6 |

All river flows tested were steady flow conditions. The design discharge for navigation was 45,000 cfs. Once a plan was determined to be acceptable for this discharge, navigation conditions were evaluated for all discharges.

Tests were conducted by introducing the appropriate discharge into the model and maintaining the associated upper pool and tailwater elevations for each simulated discharge. The pool elevations were monitored within the model with piezometer gauges located in the main river channel of the model. The upper pool elevation was controlled at model Gauge 6 and the tailwater was controlled at model Gauge 9 (Figure 3).

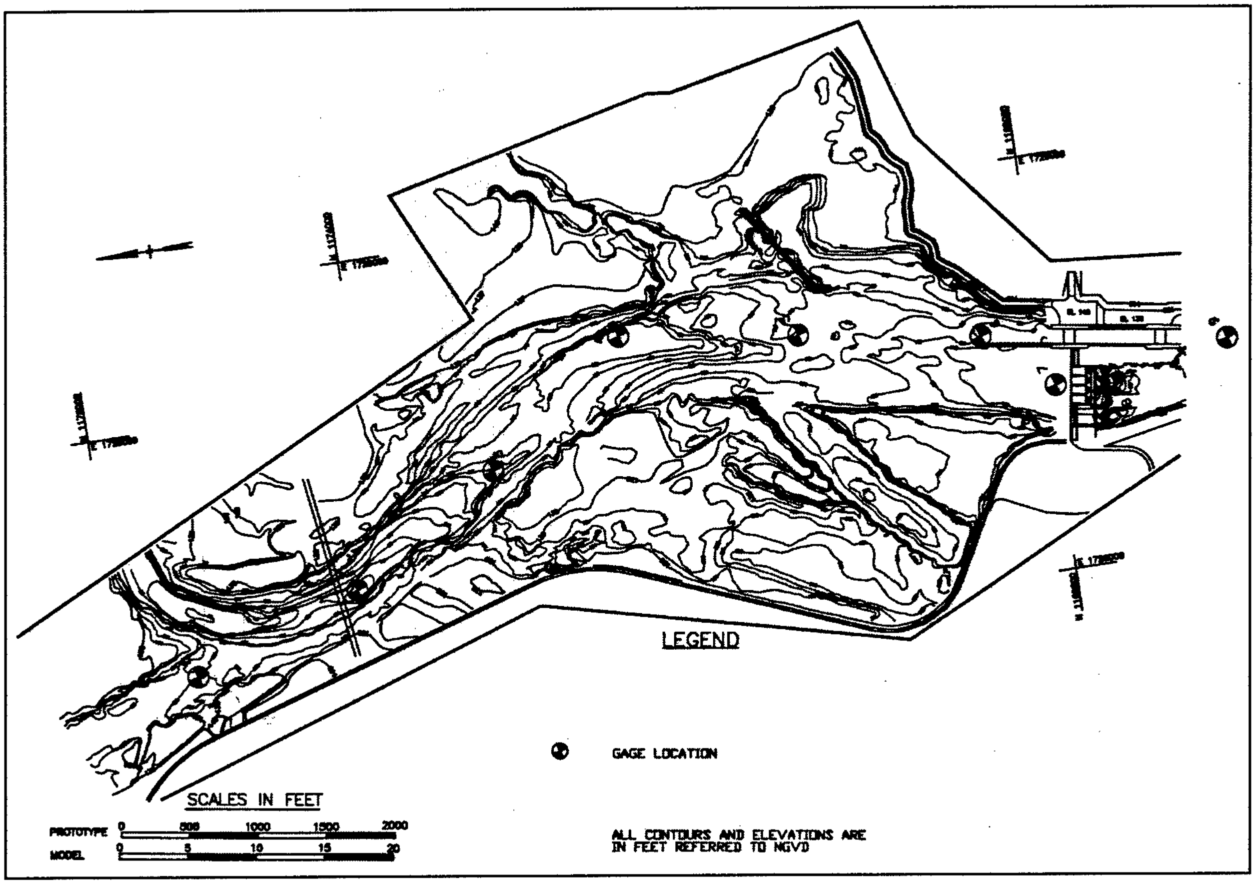



Figure 3. Model pool bathymetry and gage locations in upper approach

Current directions and velocities (CDV's) were measured using a video tracking system (VTS). Current directions were determined by plotting the paths of the floats (Figure 4), and current magnitudes were determined by timing the travel of the floats over a measured distance. In the interest of clarity, in areas where turbulence, eddies, and crosscurrents existed, the plots showed only the main trends.

A model towboat, representing a 100-ft-long pusher boat and an eight-barge flotilla (105-feet wide by 585-feet long), was used to demonstrate navigation conditions for tows entering and leaving the upper lock approach (Figure 5). The VTS was used to track the path of the model tow through the study reach.

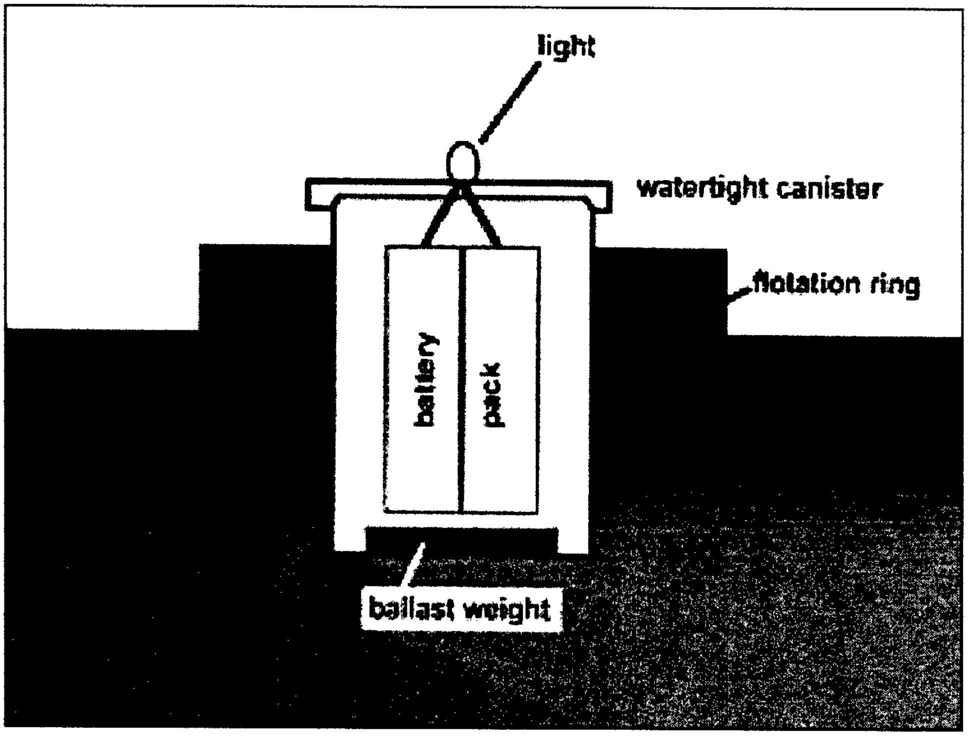



Figure 4. CDV float

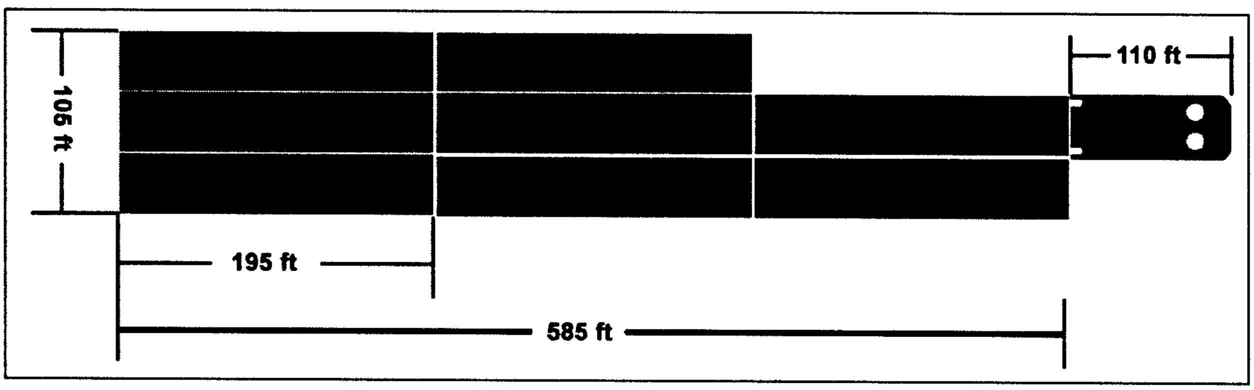



Figure 5. Design tow for Tombigbee Waterway

## Base Tests with Existing Conditions

The existing conditions in the base tests are shown in Figures 2, 3 and 6. Because there have been no changes to the model since the base tests were previously performed, they were not a part of this study. Only a description of the model features in the base tests are discussed to show the test plan progression. Base test information is available as a part of the previous study.[1] The existing configurations consist of the following principal features.

[1] Lynch, G. C. (2001). "Outdraft at lock approach, Tom Bevill Lock and Dam, Alabama: Hydraulic model investigation," Technical Report ERDC/CHL TR-01-4, U.S. Army Engineer Research and Development Center, Vicksburg, MS.

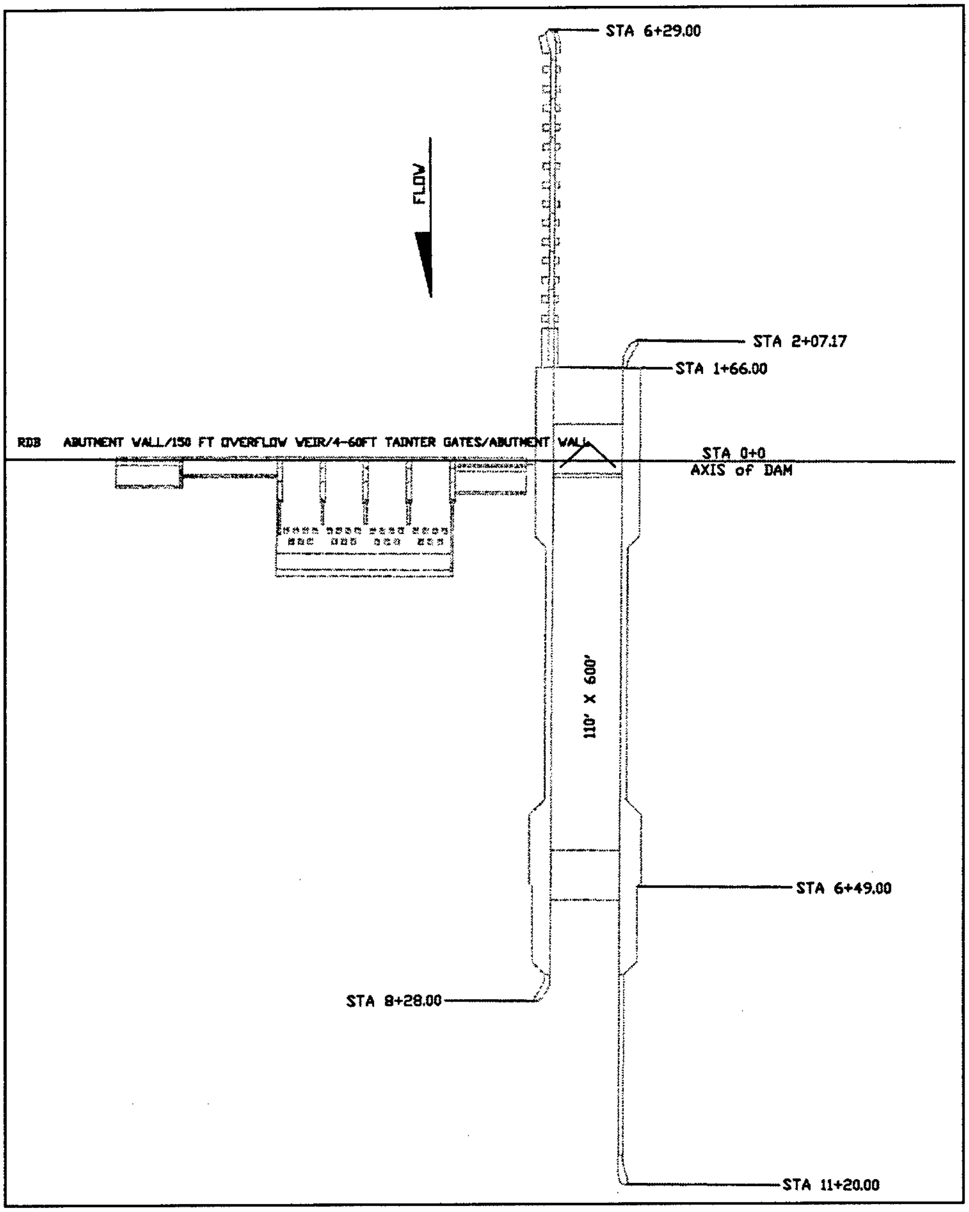



Figure 6. Tom Bevill lock and dam structure

*a.* A 110-ft by 600-ft lock chamber adjacent to the left descending bank.

*b.* A nonported landside guide wall extending to sta 2 + 07.17.

*c.* A ported riverside guard wall extending to sta 6 + 29.00.

*d.* A 430-ft-long dam consisting of four, 60-ft-wide tainter gate bays with a crest el of 111.0.

*e.* A 150-ft fixed-crest overflow weir with a crest el of 136.0. The fixed crest weir is located adjacent to the dam connected to the right descending bank.

*f.* An 800-ft-long spur dike connected to the left descending bank with a crown el of 140.0. The spur dike has a 110-ft dogleg extending into the upper approach.

## Alternative Plans Evaluated

The primary objective in the development of the alternative plans was to determine if features added to the project could help eliminate or reduce the outdraft condition. A meeting among engineers in the Navigation Branch at ERDC was held to identify possible features that could be constructed in the prototype to correct the outdraft. From the panel's discussions, six different features were selected for exploration in the physical model. These features include the following (Figure 7):

*a.* A 300-ft guard wall extension.

*b.* Removal of 100 ft of the 800-ft-long spur dike and the dogleg.

*c.* Restoration of the left descending bank line to conditions prior to project construction.

*d.* Constructing 11 bendway weirs.

*e.* Partial dredging of the island.

*f.* Dredging the approach area between the guide and guard walls extending 500 ft upstream of the guard wall.

The first two features, a 300-ft guard wall extension and the removal of 100 ft of the spur dike, were recommendations as a part of the previous study. The previous study also recommended the removal of the snag boat *Montgomery* and its appurtenant structures. All the alternative plans tested used a combination of the listed features with a design discharge of 45,000 cfs.

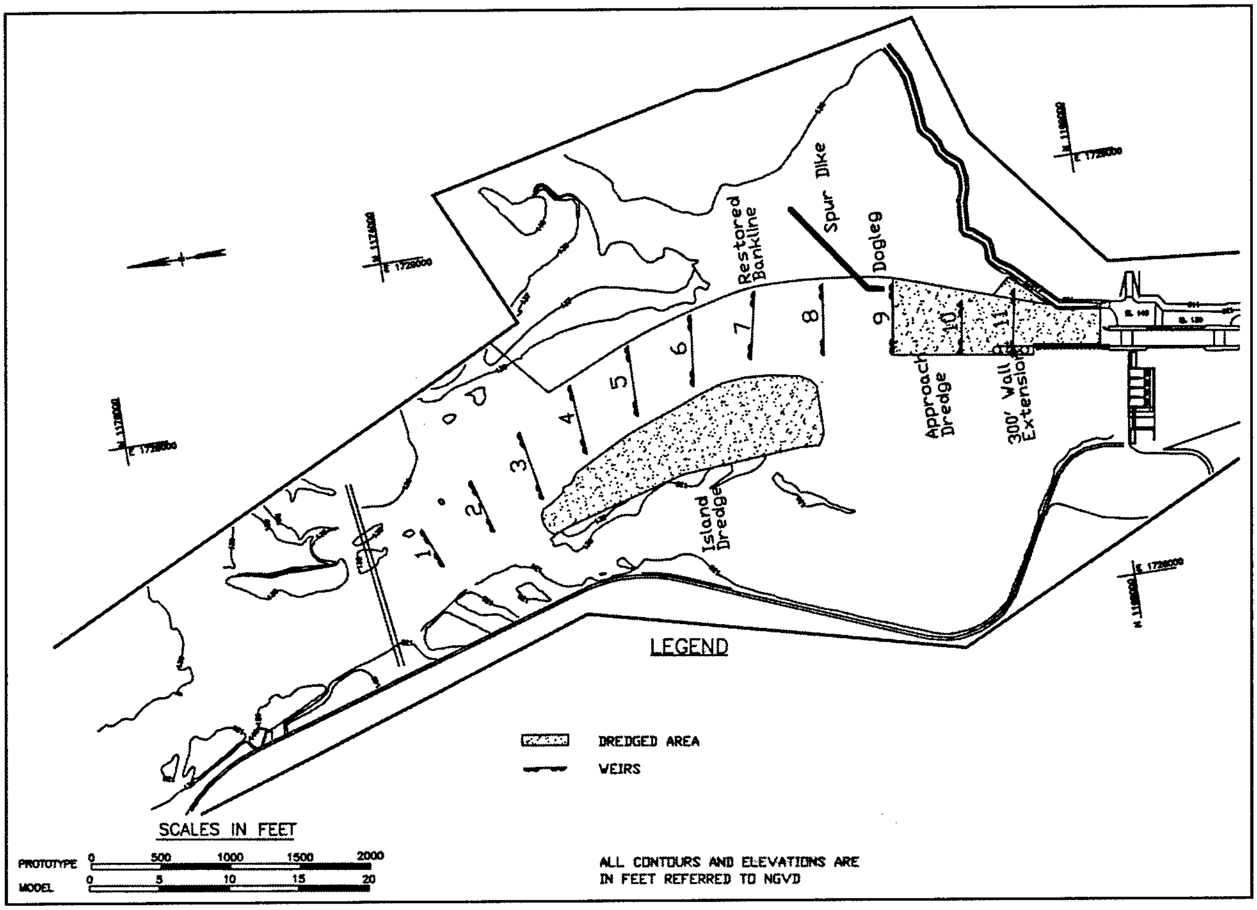



Figure 7. Alternative plan features

# Plan 1

## Description

It was determined that the first plan tested would use a combination of all features that would most likely eliminate or reduce the outdraft condition. Economics were not considered in the development of Plan 1. Plan 1 consisted of the following principal features:

*a.* A 300-ft guard wall extension.

*b.* Removal of 100 ft of the 800-ft-long spur dike.

*c.* Complete removal of the dogleg extending from the spur dike.

*d.* Complete restoration of the left descending bank line to conditions prior to project construction.

*e.* Removal of approximately 95 percent of the island near the right bank by dredging to el 116.0.

*f.* Bendway weirs 1-10 (Figure 7) with a crown el of 121.0, spaced about 500 ft apart along the left descending bank and in the lock approach.

### Results

The velocity of the currents and angle of the currents were evaluated in the upper lock approach in an area 200 ft wide by 900 ft long. The evaluation area extended 200 ft towards the left descending bank from the existing guard wall and 900 ft upstream from the bull nose of the existing guard wall. It is important to note that the azimuth of the guard wall is approximately 189 deg. An average azimuth of the currents in the approach was determined, the closer the angle of the currents to 189 deg the less the outdraft effect. In Plan 1 the higher flows were along the right descending bank. The average azimuth of the currents in the lock approach was 197 deg with an average velocity of 1.8 fps. Insertion of the 300-ft guard wall extension seemed to have an effect on the current patterns; the wall extension would make this plan safer for navigation. Using a 685-ft-long design tow with the features in Plan 1, the entire length of the tow was able to navigate behind the guard wall before encountering the outdraft. This result was caused by the 300-ft wall extension. Plan 1 provided favorable results for navigation. Plates 1 and 2 show the CDV results of Plan 1. Plates 15 through 18 show the results of the tow runs for Plan 1.

## Plan 1B

### Description

The basic goal of the remaining plans was to try to develop an alternative that would achieve results similar to Plan 1 with fewer/minimal project modifications. Plan 1B is the same as Plan 1 with one exception: the 300-ft guard wall extension of Plan 1 was not included.

### Results

Removal of the 300-ft guard wall extension seemed to have an effect on the current patterns. The azimuth of the currents in the lock approach increased along with an increase in the velocity. The average azimuth of the currents in the lock approach was 203 deg with an average velocity of 2.4 fps. Using a 685-ft-long design tow with the features in Plan 1B, approximately 585 ft of the tow was able to navigate behind the guard wall before encountering the outdraft. Plates 3 and 4 show the CDV results of Plan 2. Plates 19 through 22 show the results of the tow runs for Plan 2.

## Plan 2

### Description

Plan 2 consisted of a further reduction in the project modifications required in the previous plans. The features of Plan 2 were the same as Plan 1B except for the following:

*a.* The left descending bank line was partially restored from the spur dike to the left descending bank line upstream of the lock.

*b.* The island dredge on the right descending bank near river mile 308 was moved 100 ft riverward, thus requiring the removal of only approximately 70 percent of the island. The dredged elevation of the area around the island was 120.0.

*c.* Only weirs 3-10 were used (Figure 7) in this plan. The crown el of weir 3 was 116.0. Weirs 4-10 had a crown el of 121.0.

### Results

This plan did not significantly divert flow towards the right descending bank. Plan 2 showed an increase in the azimuth and velocity of the currents over Plan 1B. In Plan 2 the average azimuth of the currents in the lock approach was 205 deg with an average velocity of 2.5 fps. Using a 685-ft-long design tow with the features in Plan 2, approximately 390 ft of the tow was able to navigate behind the guard wall before encountering the outdraft. Thus, navigation conditions into the approach of the lock were not improved. CDV results of this plan are shown in Plate 5.

## Plan 3

### Description

The features of Plan 3 consist of the primary features of Plan 2 with the following exceptions:

*a.* Bendway weir No. 2 was added with a crown el of 116.0.

*b.* The el of the crown of weir No. 3 was changed to el 121.0.

*c.* Bendway weir No. 11 was added approximately 175 ft upstream of the guard wall with a crown el of 121.0.

*d.* The mouth of the inlet upstream of the island on the right bank was dredged to el 116.0.

### Results

This plan also failed to significantly divert flow towards the right descending bank. Plan 3 showed an increase in the azimuth and a decrease in the velocity of the currents over Plan 2. In Plan 3 the average azimuth of the currents in the lock approach was 209 deg with an average velocity of 2.1 fps. Using a 685-ft-long design tow with the features in Plan 3, approximately 100 ft of the tow was able to navigate behind the guard wall before encountering the outdraft. Thus, navigation conditions into the lock approach were not improved. CDV results of this plan can be seen in Plate 6.

## Plan 4

### Description

The features of Plan 4 are the same as for Plan 3 with the following exception: The elevation of the island dredge on the right descending bank near river mile 308 was changed to el 116.0.

### Results

This plan failed to significantly divert flow towards the right descending bank. Plan 4 showed a decrease in the azimuth and a decrease in the velocity of the currents over Plan 3. Though Plan 4 showed favorable results over Plan 3 the results of the azimuth and velocity of the currents were larger than those encountered in Plan 1. In Plan 4 the average azimuth of the currents in the lock approach was 204 deg with an average velocity of 1.6 fps. Using a 685-ft-long design tow with the features in Plan 4, approximately 200 ft of the tow was able to navigate behind the guard wall before encountering the outdraft. Thus, navigation conditions into the lock approach were not improved. CDV results of this plan can be seen in Plate 7.

## Plan 5

### Description

The features of Plan 5 are the same as Plan 2 with the following exception: the elevation of the island dredge on the right descending bank near river mile 308 was changed to el 116.0.

### Results

This plan also failed to significantly divert flow towards the right descending bank. Plan 5 showed an increase in the azimuth and an increase in the velocity of the currents over Plan 4. In Plan 5 the average azimuth of the currents in the lock approach was 208 deg with an average velocity of 1.9 fps. Using a 685-ft-long

design tow with the features in Plan 5, approximately 100 ft of the tow was able to navigate behind the guard wall before encountering the outdraft. Thus, navigation conditions into the lock approach were not improved. CDV results of this plan can be seen in Plate 8.

# Plan 6

## Description

This plan had the same configuration as Plan 5 with one exception: Weir 10 that was located approximately 500 ft above the guard wall was removed. Only weirs 3-9 were included in this plan.

## Results

This plan failed to improve navigation into the lock approach. Plan 6 showed results similar to those recorded in Plan 5. In Plan 6 the average azimuth of the currents in the lock approach was 205 deg with an average velocity of 1.8 fps. Using a 685-ft-long design tow with the features in Plan 6, approximately 150 ft of the tow was able to navigate behind the guard wall before encountering the outdraft. Thus, navigation conditions were not improved. CDV results of this plan can be seen in Plate 9.

# Plan 7

## Description

The features of Plan 7 included the following:

*a.* No restoration of the left descending bank line (Figure 8).

*b.* Removal of 100 ft of the 800-ft-long spur dike.

*c.* Complete removal of the dogleg extending from the spur dike.

*d.* An area of the lock approach extending 500 ft above the guard wall was dredged to el 110.0.

*e.* The island dredge on the right descending bank near river mile 308 was moved 100 ft riverward, thus requiring the removal of only approximately 70 percent of the island. The area around the island was el 116.0.

*f.* Bendway weirs 3-11 were used. Weir No. 3 had a crown el of 116.0. Weirs 4-10 had a crown el of 121.0.

## Results

This plan was effective in diverting flow towards the right descending bank, thereby slowing currents over the bendway weir field and improving navigation conditions into the lock approach with all the river flows tested. Plan 7 produced the smallest azimuth difference from that of the guard wall and the slowest velocity of currents of all the plans tested. In Plan 7 the average azimuth of the currents in the lock approach was 193 deg with an average velocity of 0.7 fps. Using a 685-ft-long design tow with the features in Plan 7, the entire length of the tow was able to navigate behind the guard wall without encountering the outdraft. Plates 10 through 14 show the CDV results of Plan 7. Plates 23 through 32 show the results of the tow runs for Plan 7.

# 4 Conclusions and Recommendations

## Limitations of Model Results

The results of this study indicate the effects of the various model plans on CDV's and the resulting effects they had on the navigation conditions for tows entering and leaving the upper lock approach. In the evaluation it should be noted that small changes in current direction and magnitude are not necessarily changes produced by a particular modification. Several floats introduced at the same point in the model may follow slightly different paths and move at slightly different velocities because of the hydraulics of eddies, pulsating currents, and other hydrodynamic anomalies. The CDV's shown in the plates were taken with floats drafted to 9 ft, approximately the draft of a loaded barge. They are meant to be indicative of the currents that affect towboats and barges.

It is also important to note that the model was a fixed bed model. This means that it was not designed to reproduce any changes in the bed that might occur in the prototype with varying flows. Thus, changes in the channel configuration resulting from scouring and/or deposition and any resulting changes in current direction and magnitude cannot be evaluated.

## Summary of Results and Conclusions

The following results and conclusions were derived during the study:

*a.* The dredge cut of the near upper approach to el 110.0 increased the cross-sectional area of the upper approach. This increase in area resulted in a decrease in velocities. The increased depth also allowed the bendway weirs placed in the approach to perform work more effectively.

*b.* The area around the island was dredged to el 116.0. The dredge cut also increased the channel cross-sectional area, resulting in reduced velocities. This dredged area also gave the bendway weirs an area to redirect current flow thus equalizing the velocities in the channel.

*c.* A system of nine bendway weirs were installed in the model in an attempt to evenly distribute velocities. The end result was lower velocities more evenly distributed across the upper approach.

## Recommendations

CHL reinforces the previous study recommendations of the removal of 100 ft of the existing spur dike along with the dogleg and the relocation of the snag boat *Montgomery* and its appurtenant structures. CHL further recommends that the area around the island should be dredged to el 116.0 and the area extending to 500 ft above the guard wall be dredged to el 110.0. Finally CHL recommends the construction of nine bendway weirs in the upper lock approach, numbers 3-11. Further study could be performed to aid the Mobile District with construction sequencing of all features constructed at Tom Bevill Lock and Dam.

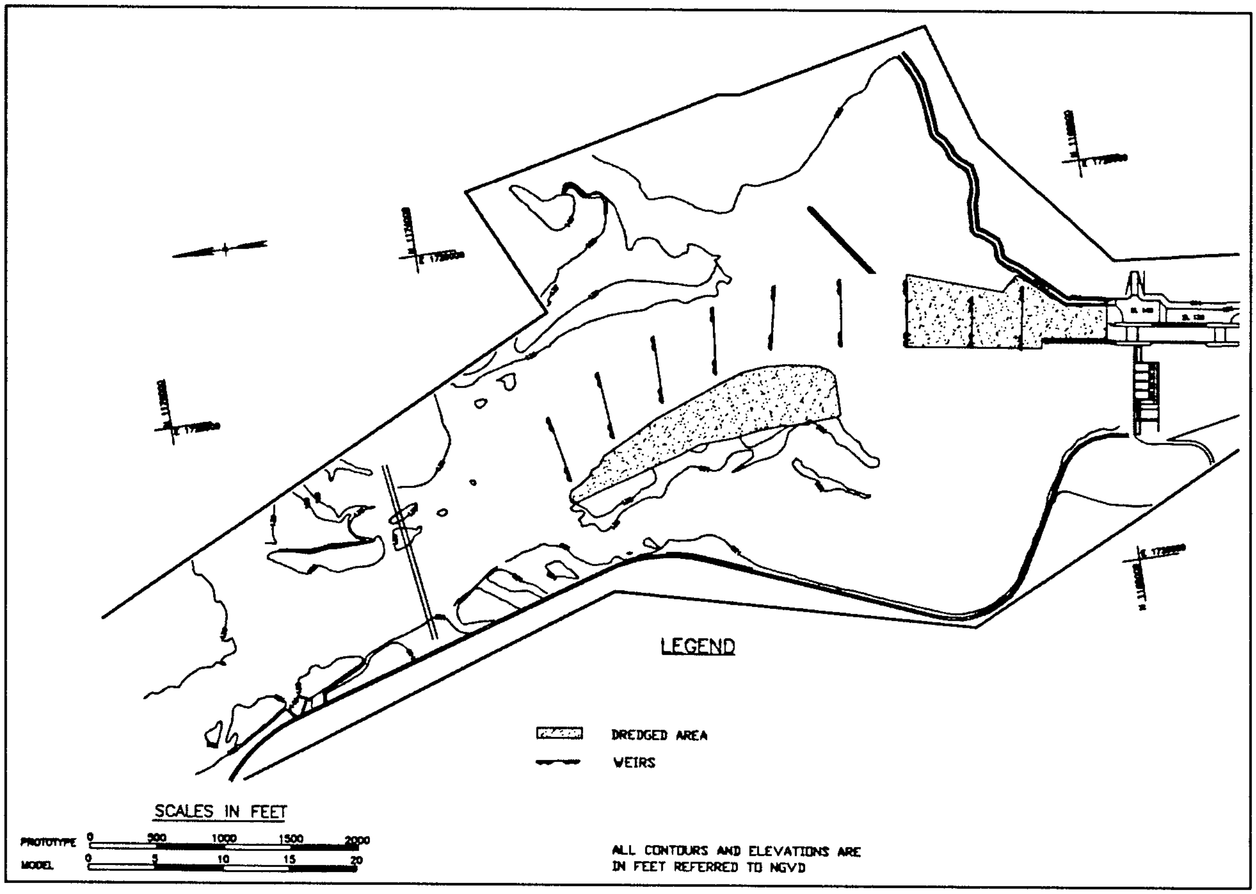



Figure 8. Plan 7 conditions

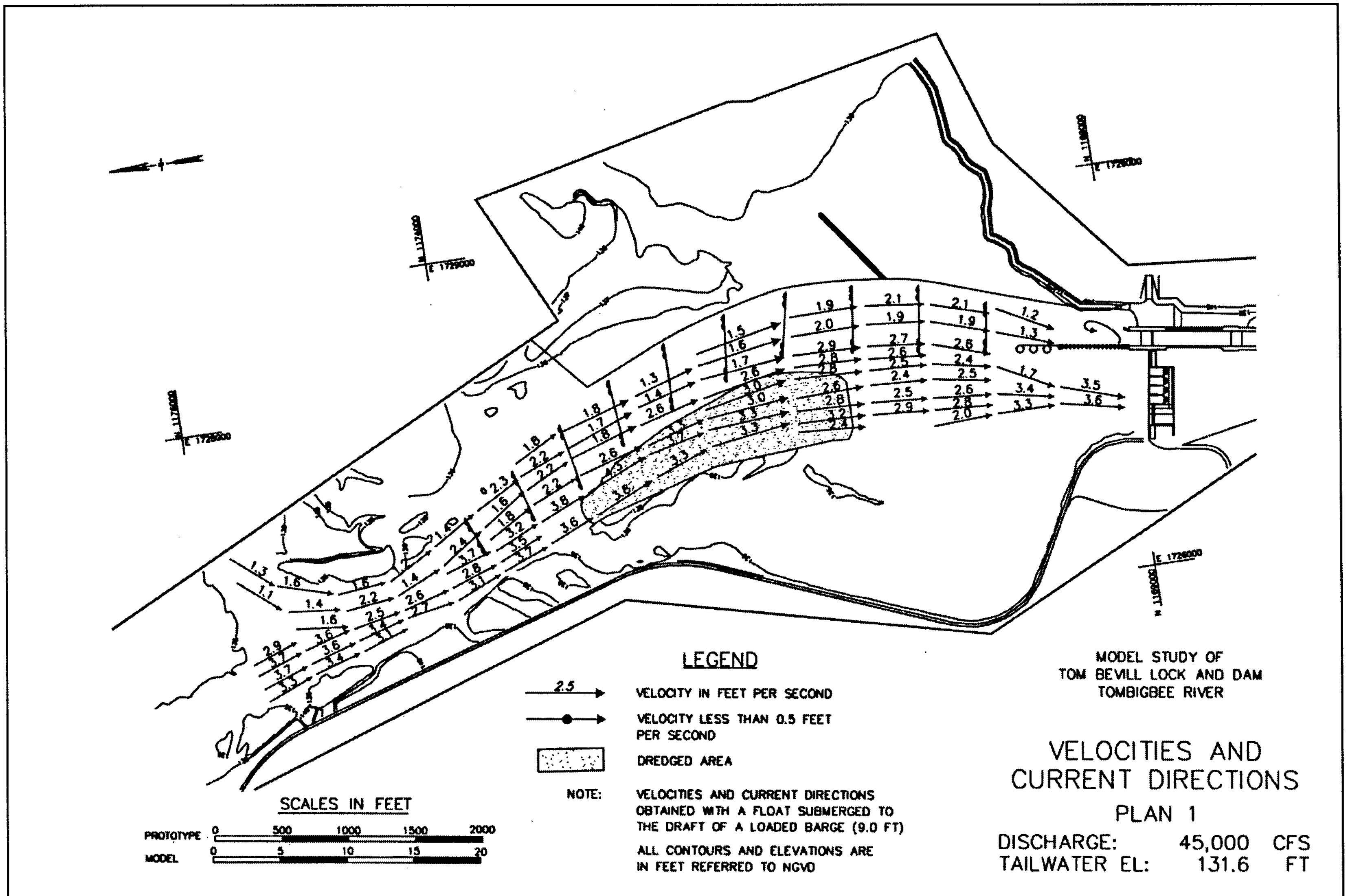
**Table 1**
**Base Tests, Water-Surface Elevations (ft, NGVD)**

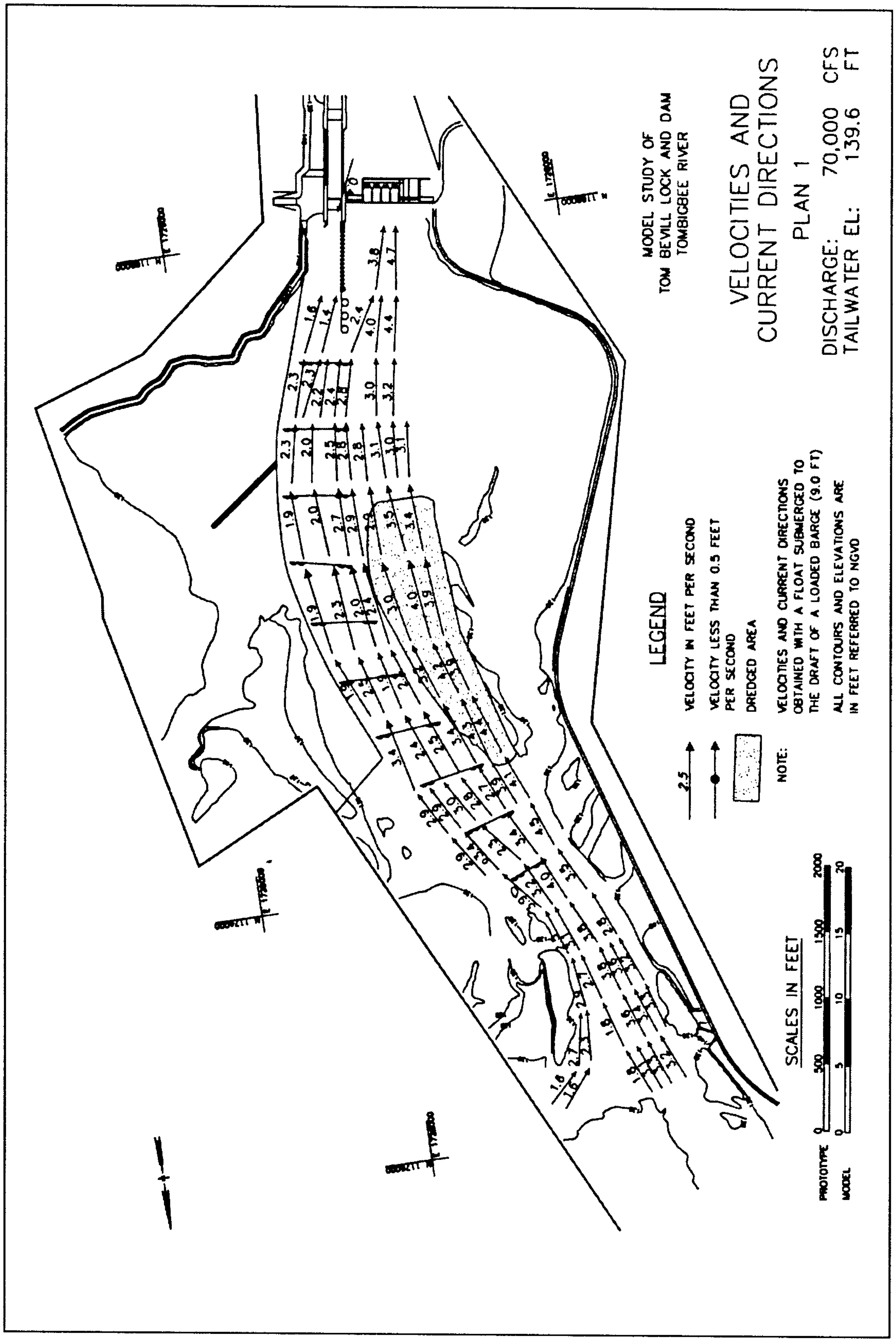
| Gauge | No. | Discharge in 1,000 cfs | | | | |
|---|---|---|---|---|---|---|
| | | 20 | 32.5 | 45 | 57.5 | 70 |
| | 1 | 136.10 | 136.15 | 136.15 | 138.10 | 141.40 |
| | 2 | 136.05 | 136.10 | 136.10 | 138.10 | 141.30 |
| | 3 | 136.00 | 136.05 | 135.05 | 138.05 | 141.25 |
| | 4 | 136.00 | 136.01 | 136.00 | 138.00 | 141.25 |
| | 5 | 136.00 | 136.00 | 136.00 | 138.00 | 141.20 |
| 6[1] | | 136.00 | 136.00 | 136.00 | 138.00 | 141.20 |
| | 7 | 136.00 | 135.95 | 135.90 | 137.85 | 140.90 |
| | 8 | 118.30 | 129.90 | 131.10 | 136.10 | 139.30 |
| 9[1] | | 118.40 | 126.00 | 131.65 | 136.40 | 139.60 |
| | 10 | 118.30 | 126.05 | 161.60 | 136.50 | 139.70 |

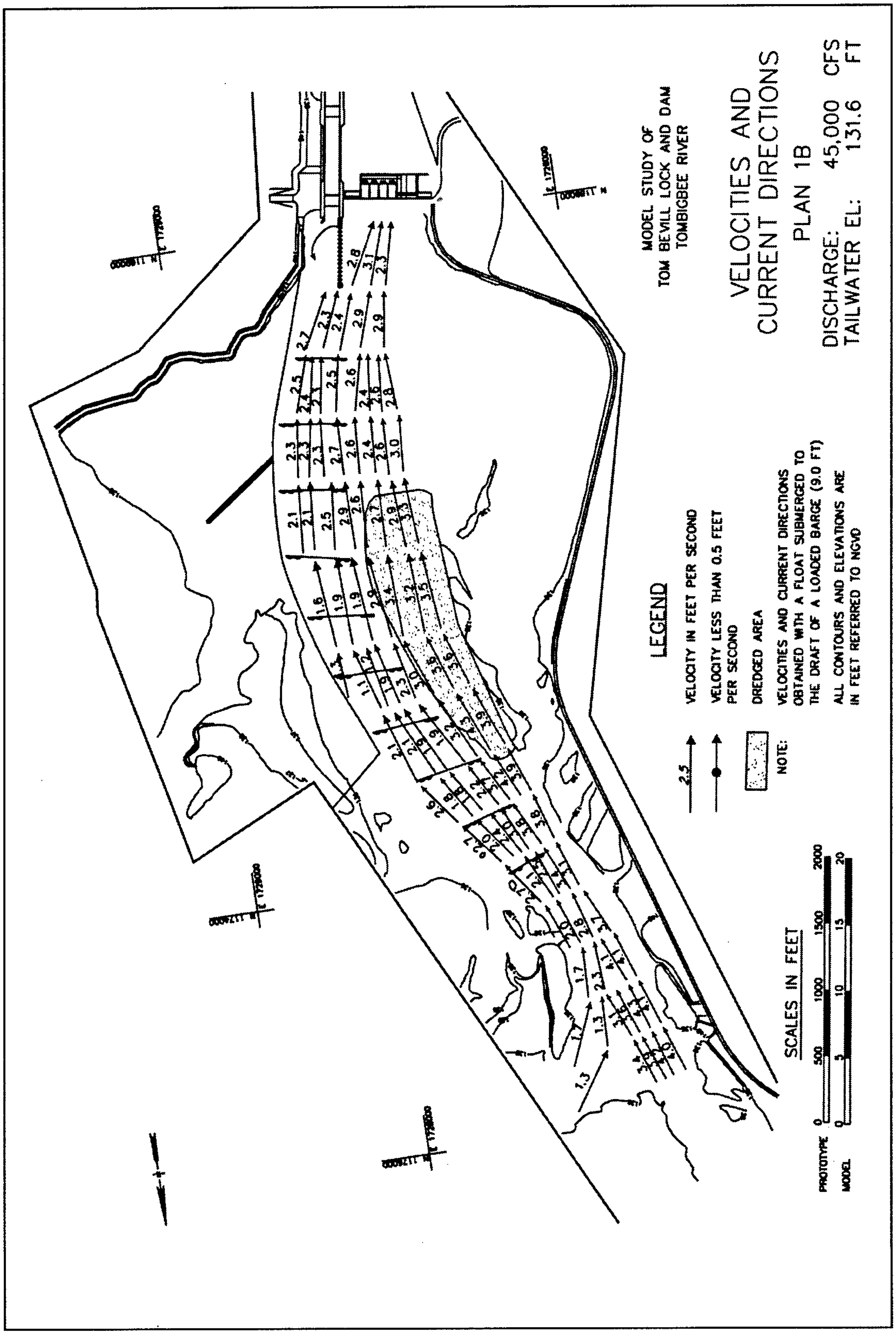
[1] Controlled elevation.

**Table 2**
**Dike Locations, Plan 7**

| Dike No. | LDB End of Dike | | Azimuth | Approx. Le | Crown El |
|---|---|---|---|---|---|
| | Northing | Easting | | | |
| 3 | 1173200.660 | 1727670.326 | 258d57'36" | 500 | 116.0 |
| 4 | 1172790.309 | 1727947.704 | 264d41'24" | 500 | 121.0 |
| 5 | 1172343.307 | 1727656.623 | 270d25'12" | 500 | 121.0 |
| 6 | 1171864.515 | 1728304.513 | 276d09'0" | 500 | 121.0 |
| 7 | 1171383.341 | 1728396.561 | 281d52'48" | 500 | 121.0 |
| 8 | 1170893.027 | 1728373.913 | 277d36'36" | 500 | 121.0 |
| 9 | 1170404.758 | 1728299.098 | 278d20'24" | 500 | 121.0 |
| 10 | 1169932.122 | 1728106.279 | 279d04'12" | 380 | 121.0 |
| 11 | 1169547.704 | 1728129.598 | 280d01'3" | 480 | 121.0 |


LEGEND
2.5
VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE:
VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20
MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND CURRENT DIRECTIONS
PLAN 1
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND
CURRENT DIRECTIONS
PLAN 1
DISCHARGE: 70,000 CFS
TAILWATER EL: 139.6 FT
LEGEND
VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE:
VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND CURRENT DIRECTIONS
PLAN 1B
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT
LEGEND
2.5 VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE: VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20

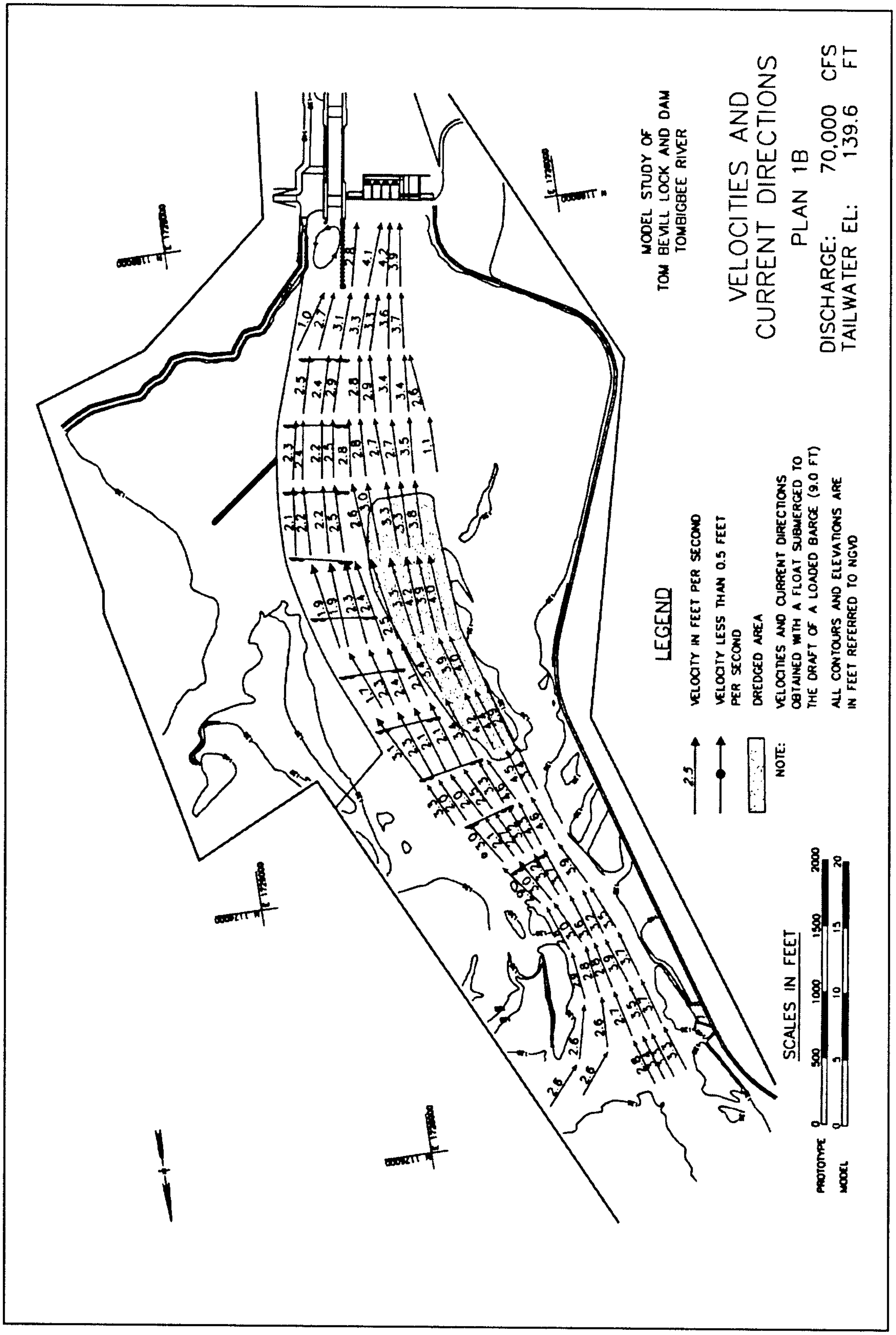
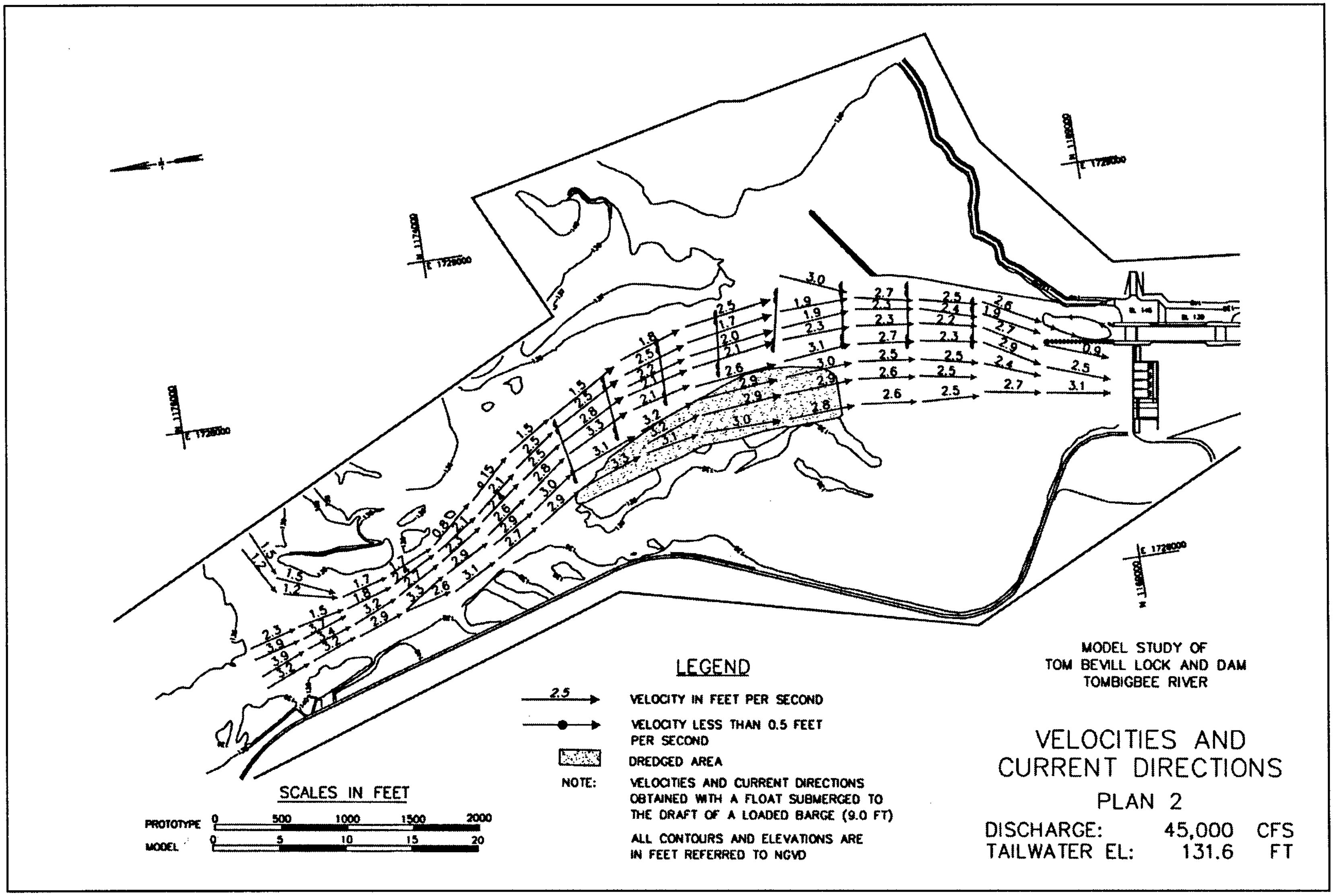
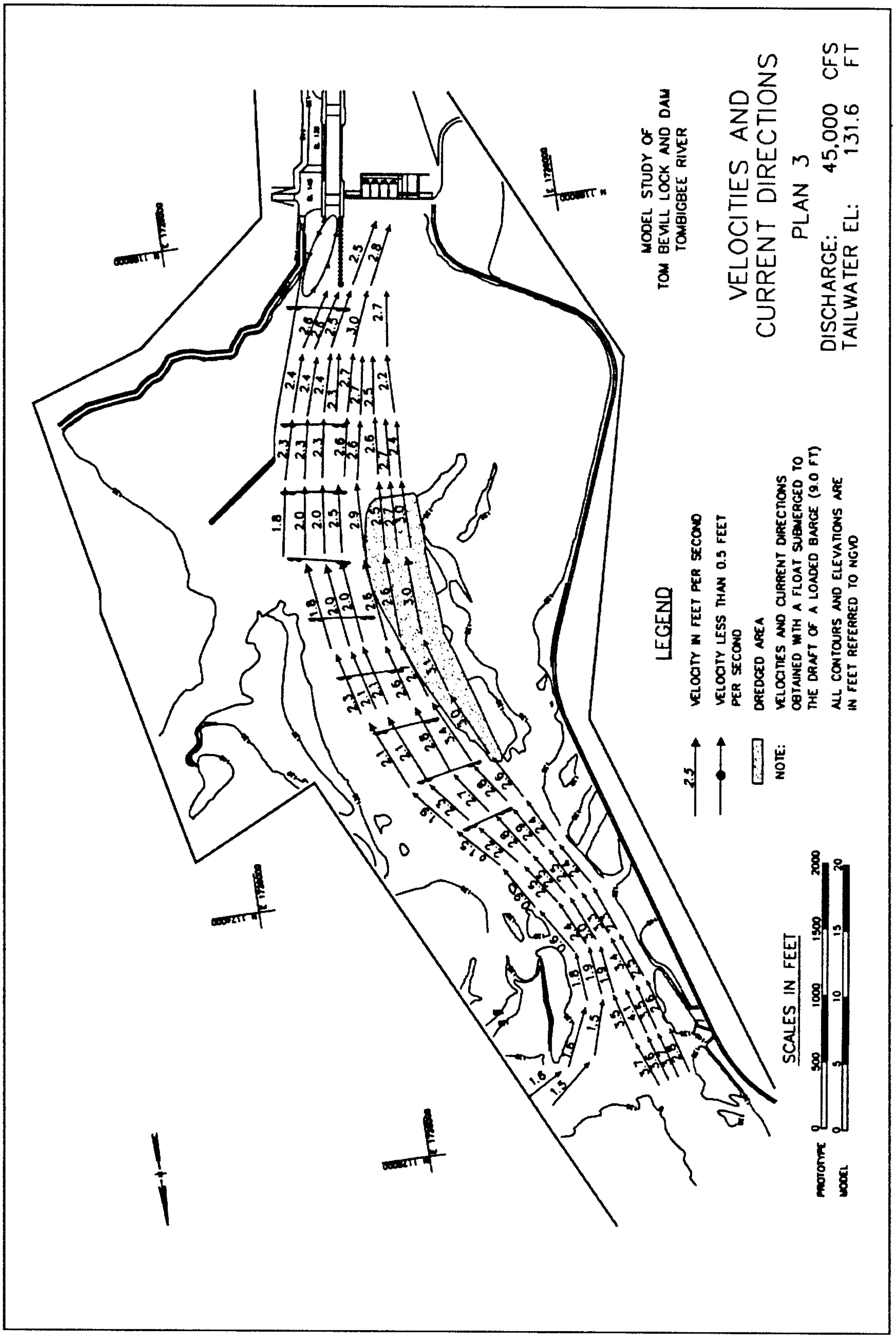
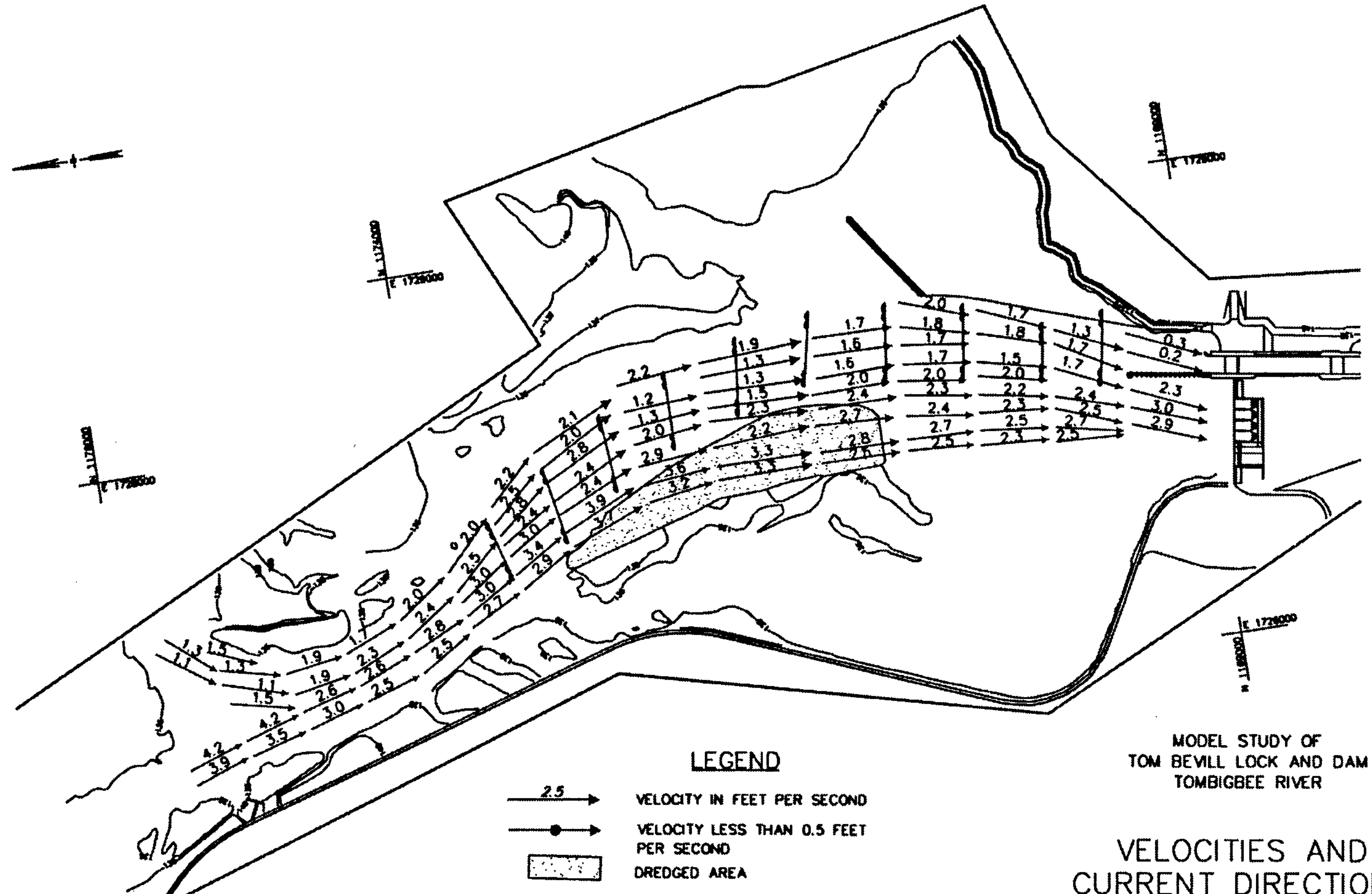

MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND
CURRENT DIRECTIONS
PLAN 1B
DISCHARGE: 70,000 CFS
TAILWATER EL: 139.6 FT
LEGEND
2.5
VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE:
VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20

Plate 4


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND
CURRENT DIRECTIONS
PLAN 2
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT
LEGEND
VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE: VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND
CURRENT DIRECTIONS
PLAN 3
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT
LEGEND
VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE: VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20



SCALES IN FEET

PROTOTYPE 0 500 1000 1500 2000

MODEL 0 5 10 15 20

LEGEND

2.5 VELOCITY IN FEET PER SECOND

VELOCITY LESS THAN 0.5 FEET PER SECOND

DREDGED AREA

NOTE: VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)

ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER

VELOCITIES AND CURRENT DIRECTIONS

PLAN 4

DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT

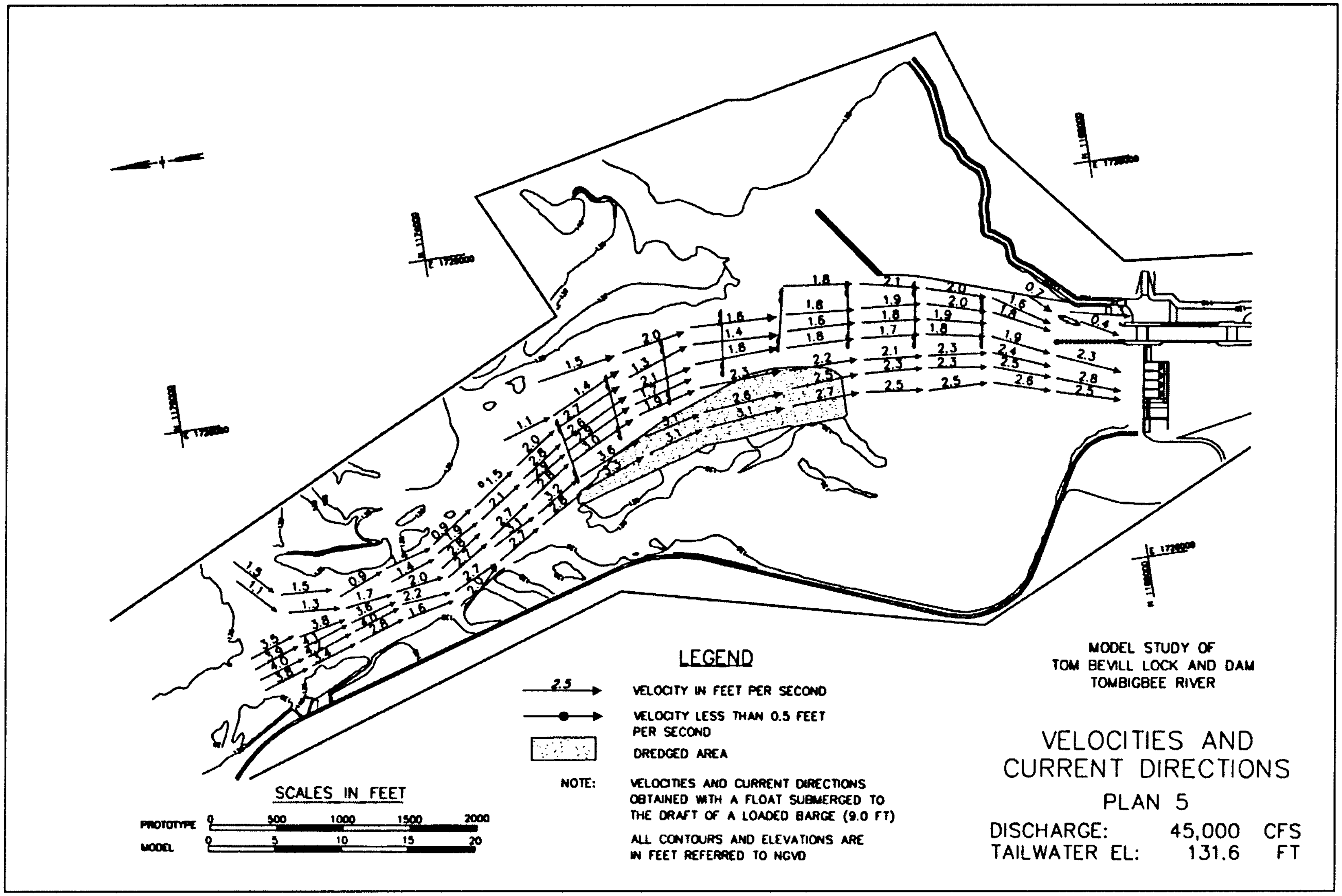
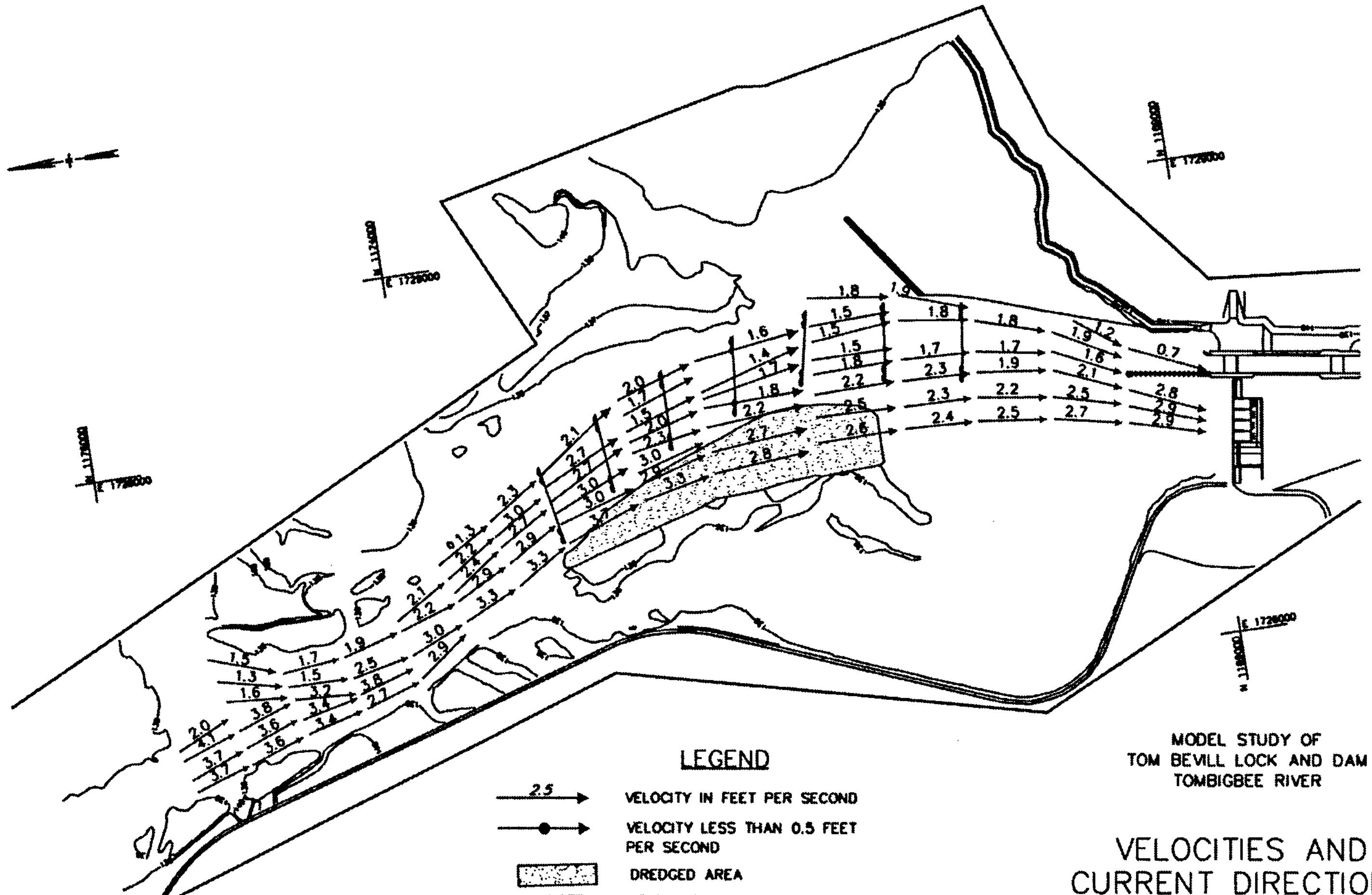

LEGEND
2.5 VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE: VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20
MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND CURRENT DIRECTIONS
PLAN 5
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT

Plate 8



SCALES IN FEET

PROTOTYPE 0 500 1000 1500 2000

MODEL 0 5 10 15 20

LEGEND

2.5 VELOCITY IN FEET PER SECOND

VELOCITY LESS THAN 0.5 FEET PER SECOND

DREDGED AREA

NOTE: VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)

ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER

VELOCITIES AND CURRENT DIRECTIONS

PLAN 6

DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT

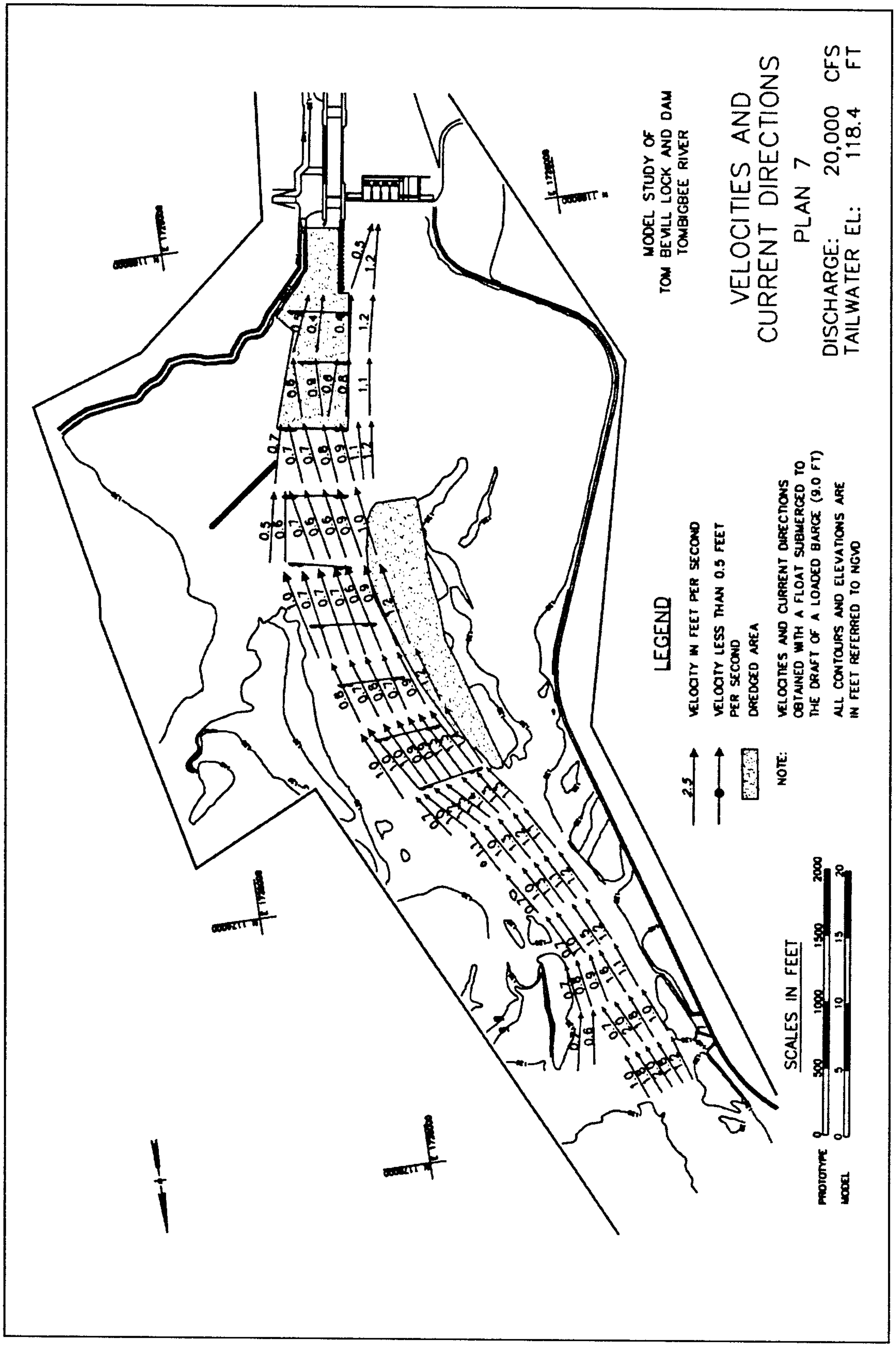
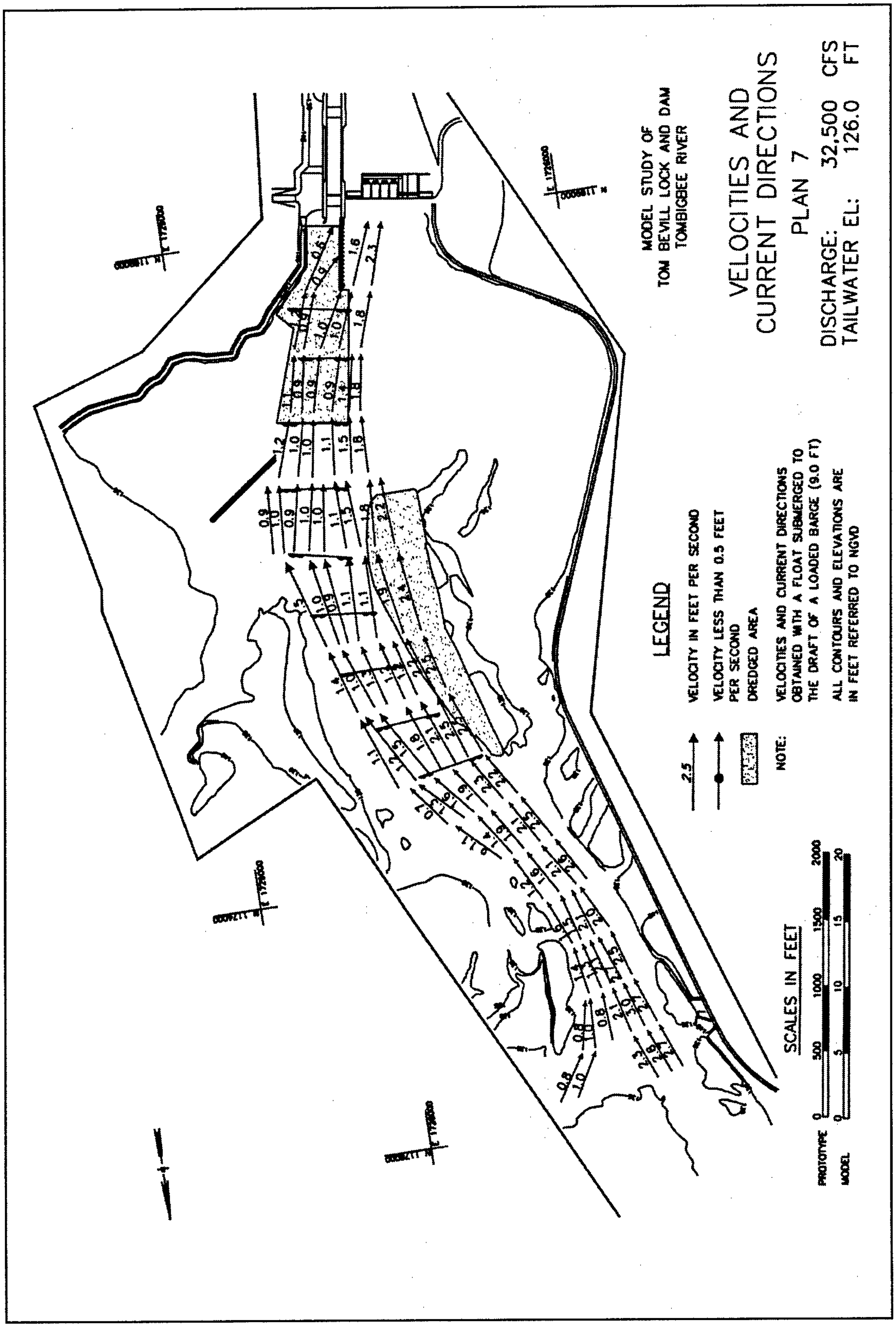

MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND
CURRENT DIRECTIONS
PLAN 7
DISCHARGE: 20,000 CFS
TAILWATER EL: 118.4 FT
LEGEND
2.5 VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE: VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20

Plate 10


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND
CURRENT DIRECTIONS
PLAN 7
DISCHARGE: 32,500 CFS
TAILWATER EL: 126.0 FT
LEGEND
2.5 VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE: VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20

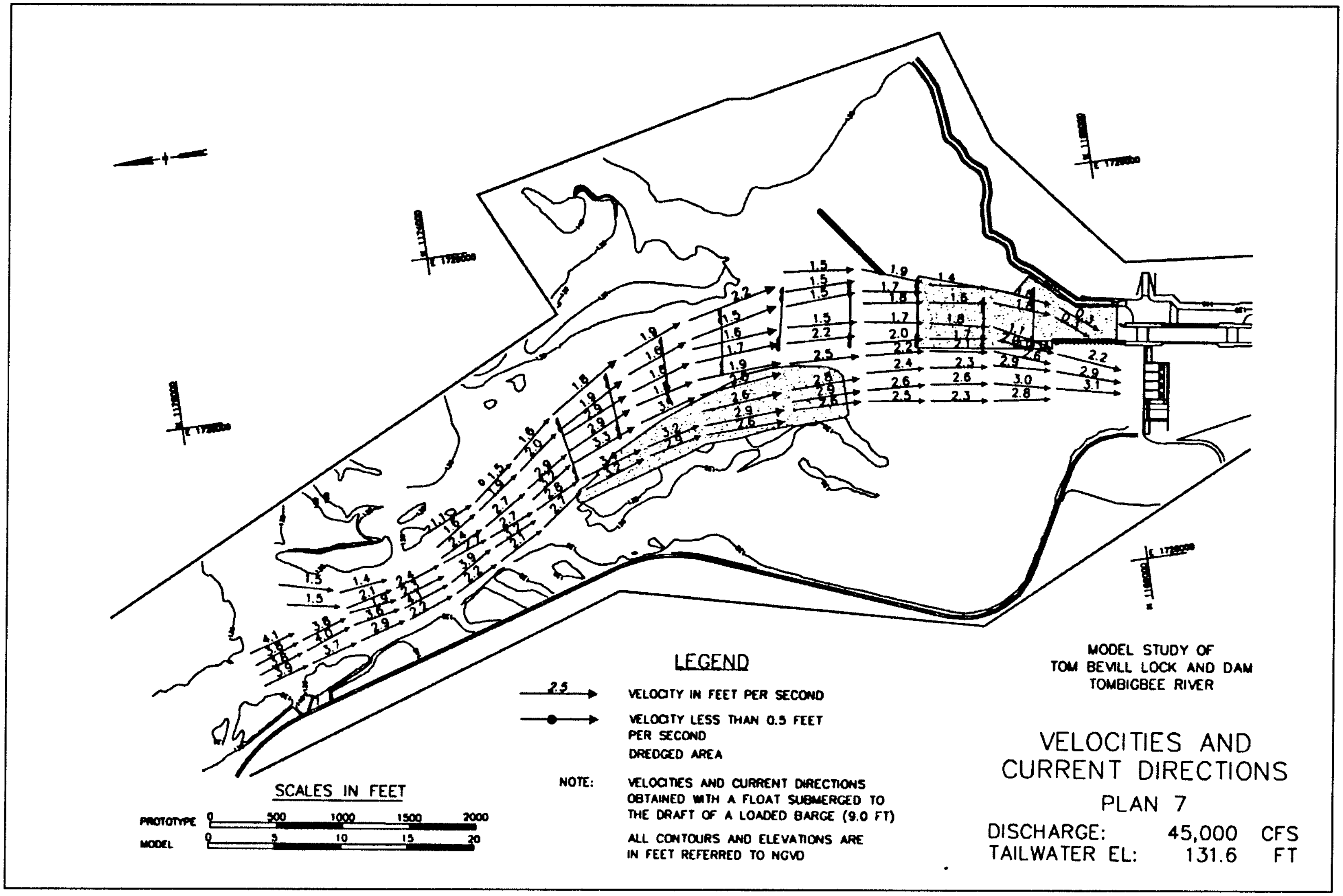
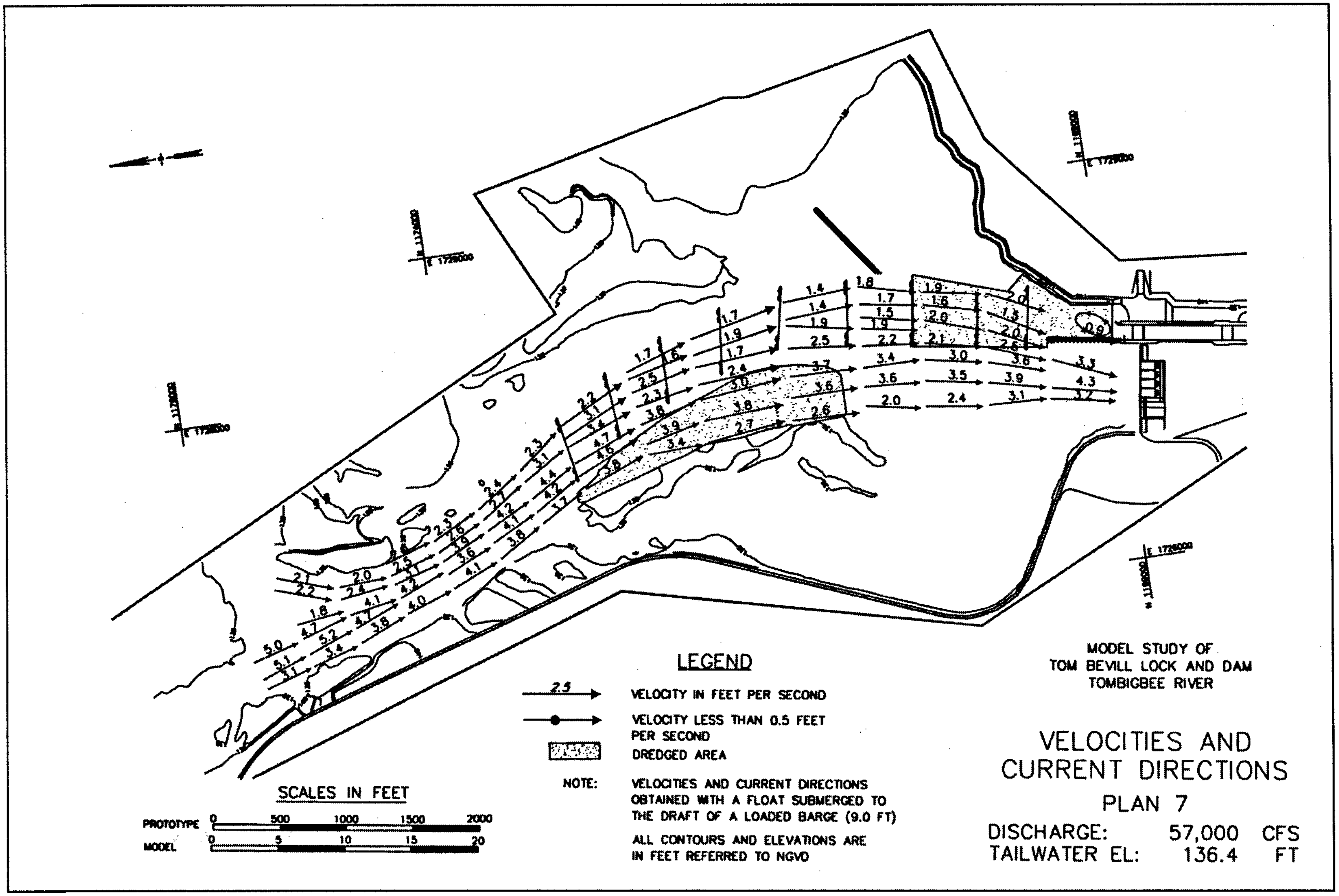
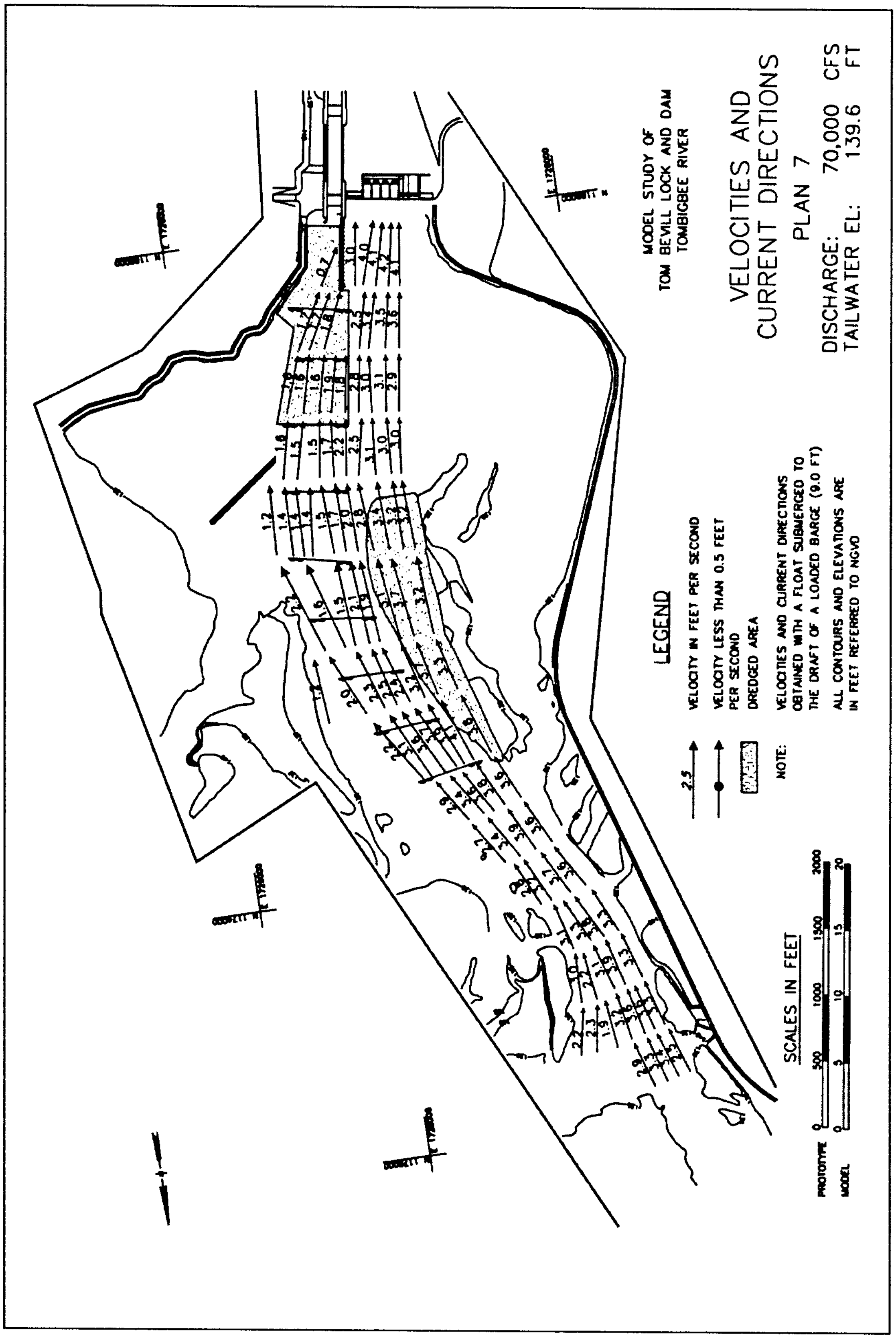
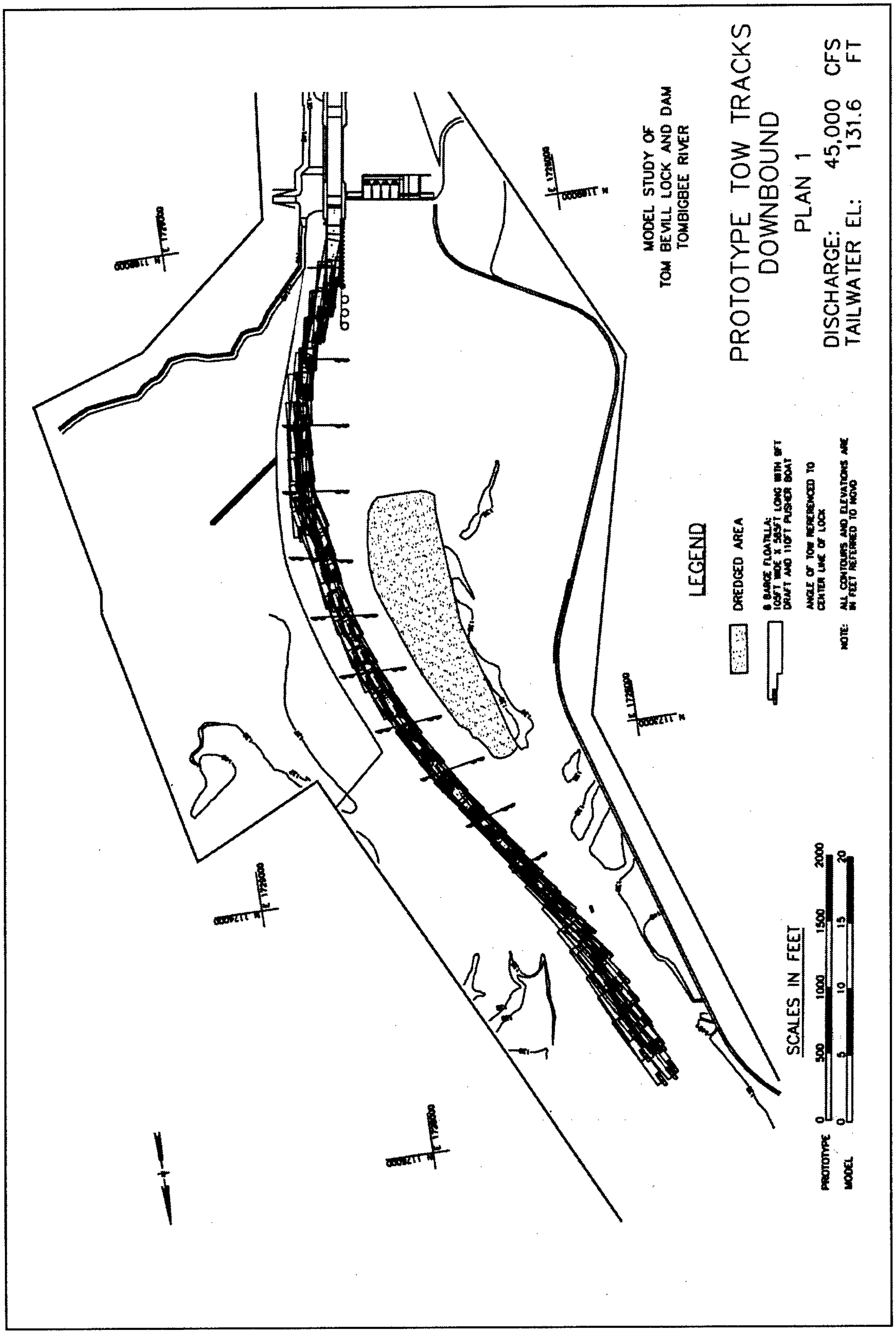

MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND
CURRENT DIRECTIONS
PLAN 7
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT
LEGEND
2.5
VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE:
VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE
0
500
1000
1500
2000
MODEL
0
5
10
15
20

Plate 12


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND
CURRENT DIRECTIONS
PLAN 7
DISCHARGE: 57,000 CFS
TAILWATER EL: 136.4 FT
LEGEND
2.5
VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE:
VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
VELOCITIES AND
CURRENT DIRECTIONS
PLAN 7
DISCHARGE: 70,000 CFS
TAILWATER EL: 139.6 FT
LEGEND
2.5
VELOCITY IN FEET PER SECOND
VELOCITY LESS THAN 0.5 FEET PER SECOND
DREDGED AREA
NOTE:
VELOCITIES AND CURRENT DIRECTIONS OBTAINED WITH A FLOAT SUBMERGED TO THE DRAFT OF A LOADED BARGE (9.0 FT)
ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
DOWNBOUND
PLAN 1
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT
LEGEND
DREDGED AREA
8 BARGE FLOATILLA:
105FT WIDE X 585FT LONG WITH 9FT
DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO
CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE
IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20

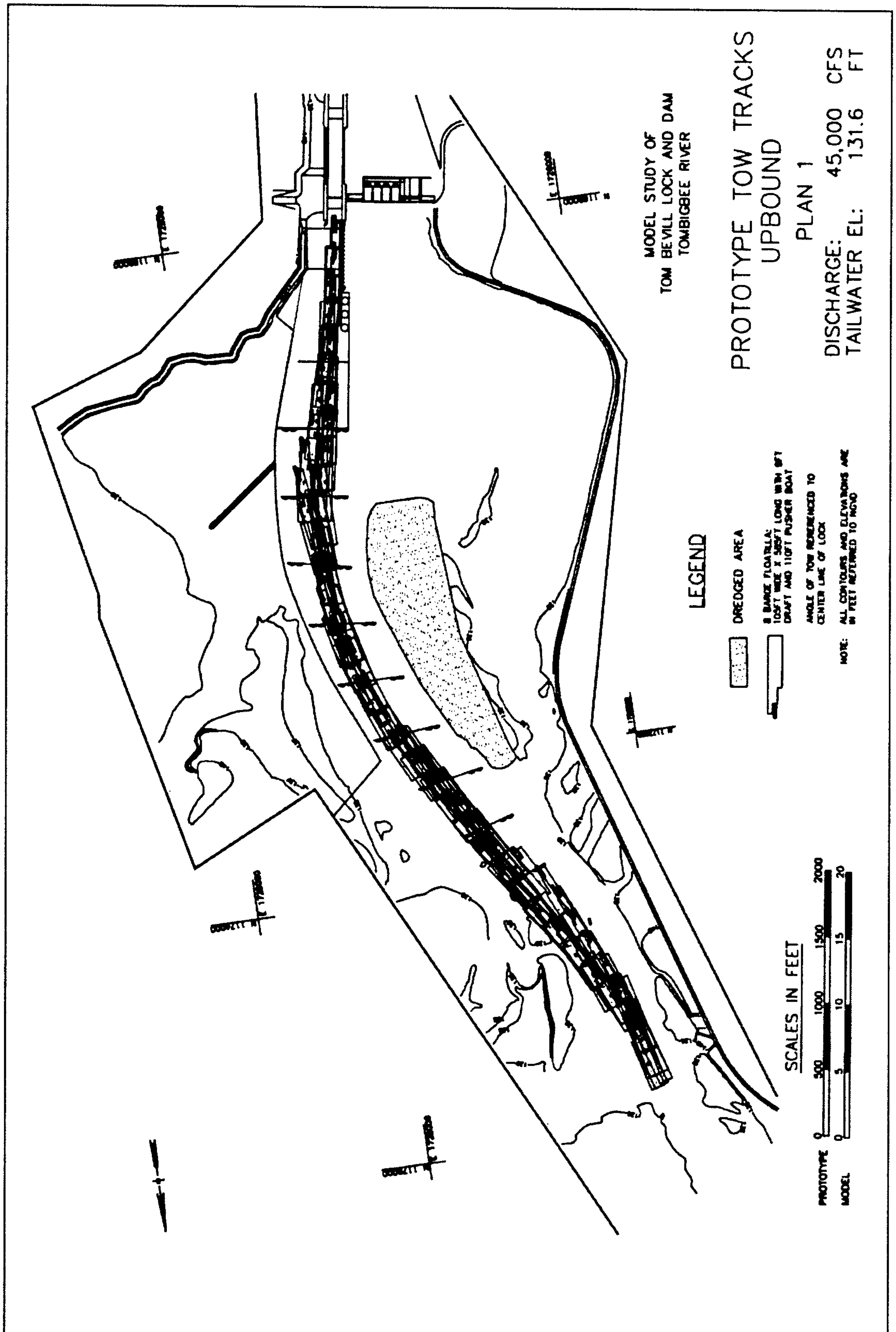

MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
UPBOUND
PLAN 1
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT
LEGEND
DREDGED AREA
8 BARGE FLOTILLA: 105FT WIDE X 385FT LONG WITH 9FT DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20

Plate 16

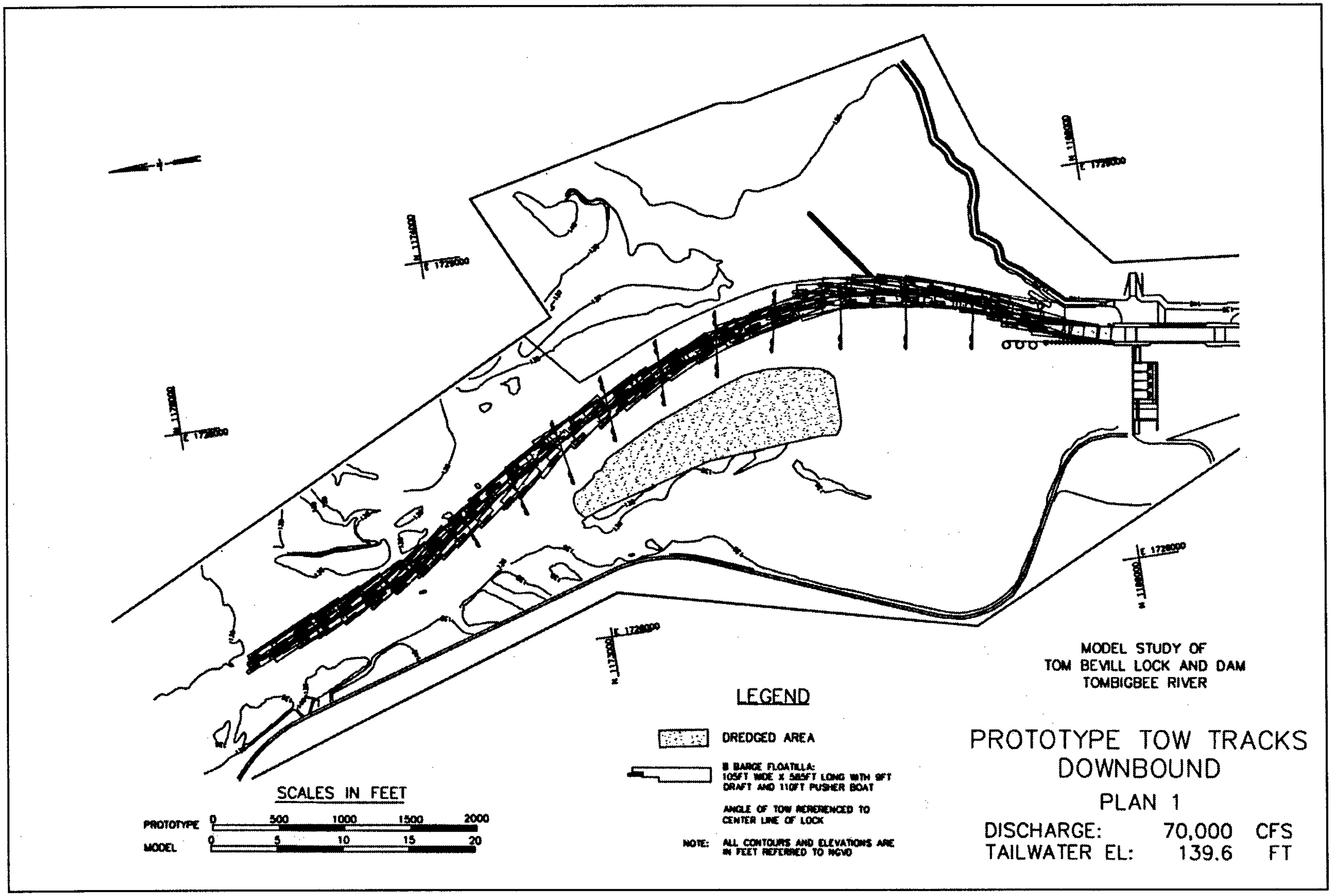
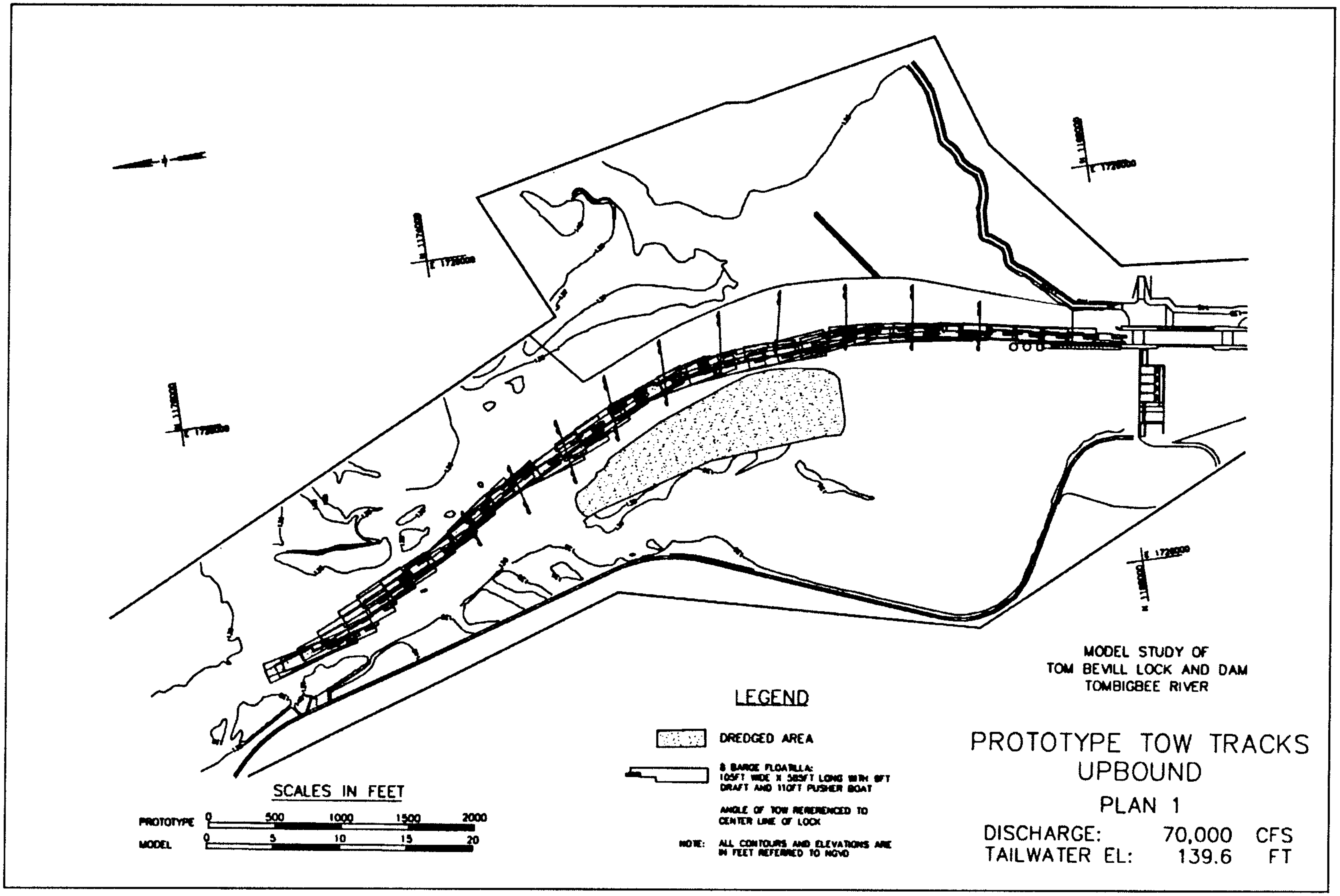
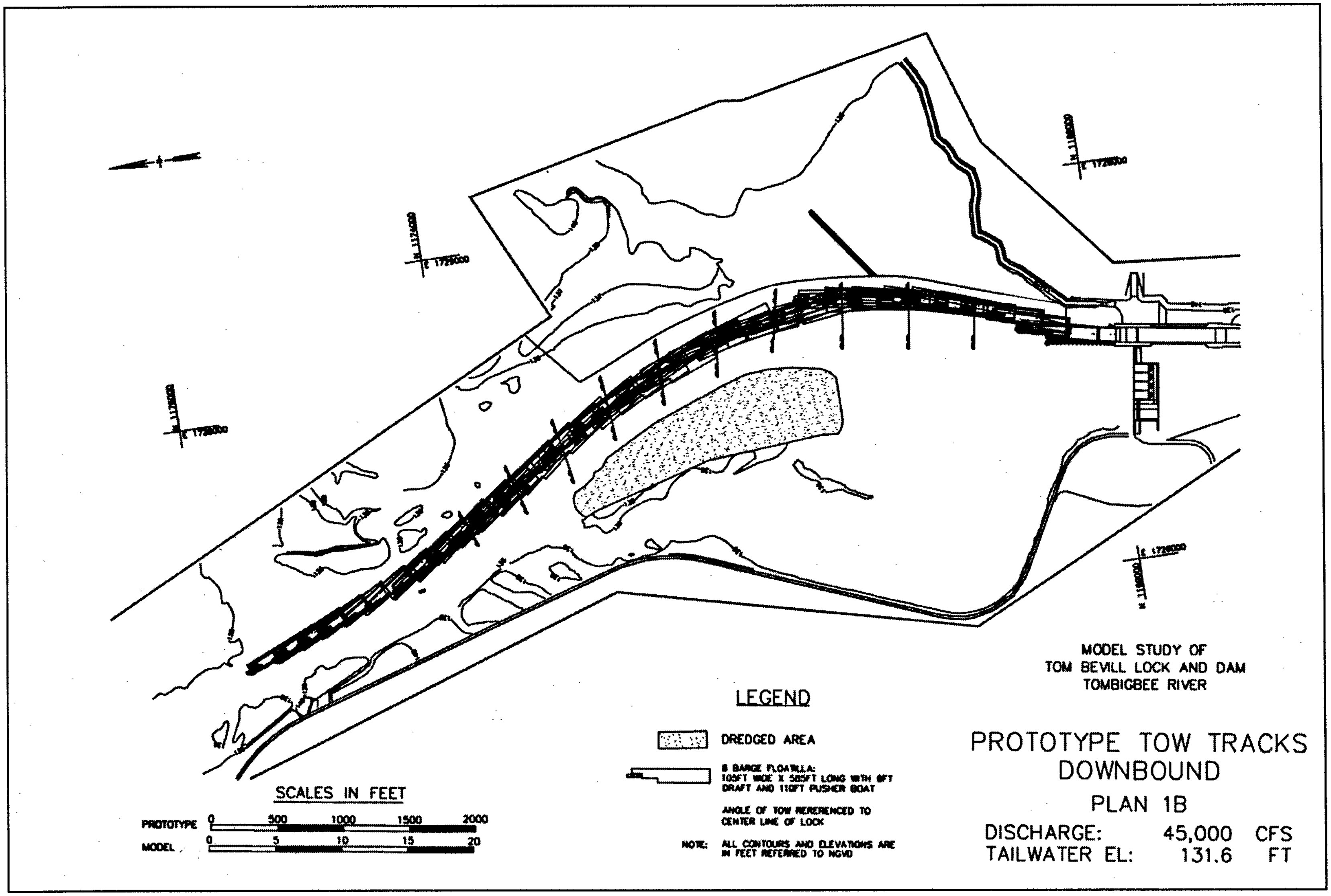
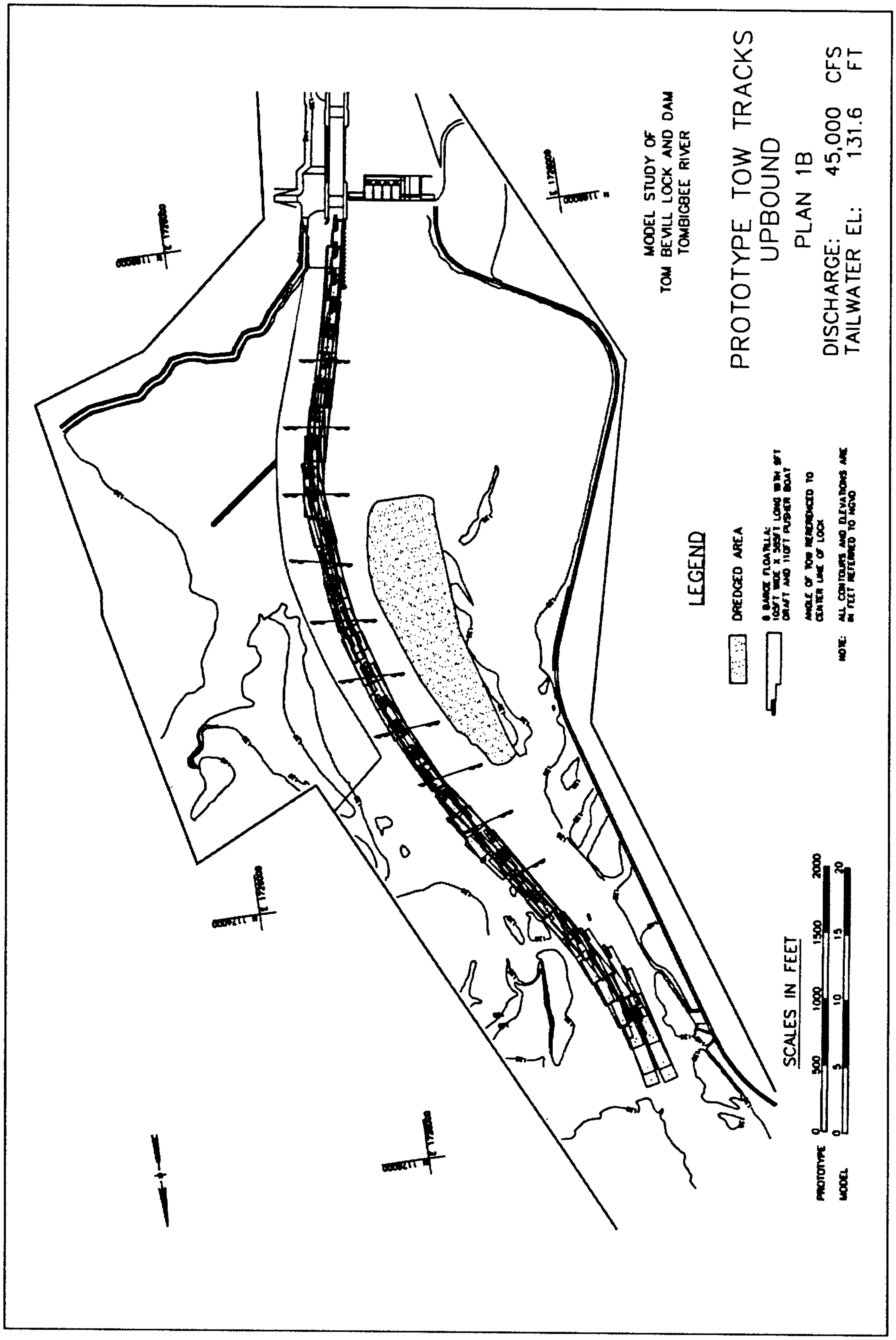

MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
LEGEND
DREDGED AREA
8 BARGE FLOATILLA:
105FT WIDE X 585FT LONG WITH 9FT
DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO
CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE
IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20
PROTOTYPE TOW TRACKS
DOWNBOUND
PLAN 1
DISCHARGE: 70,000 CFS
TAILWATER EL: 139.6 FT

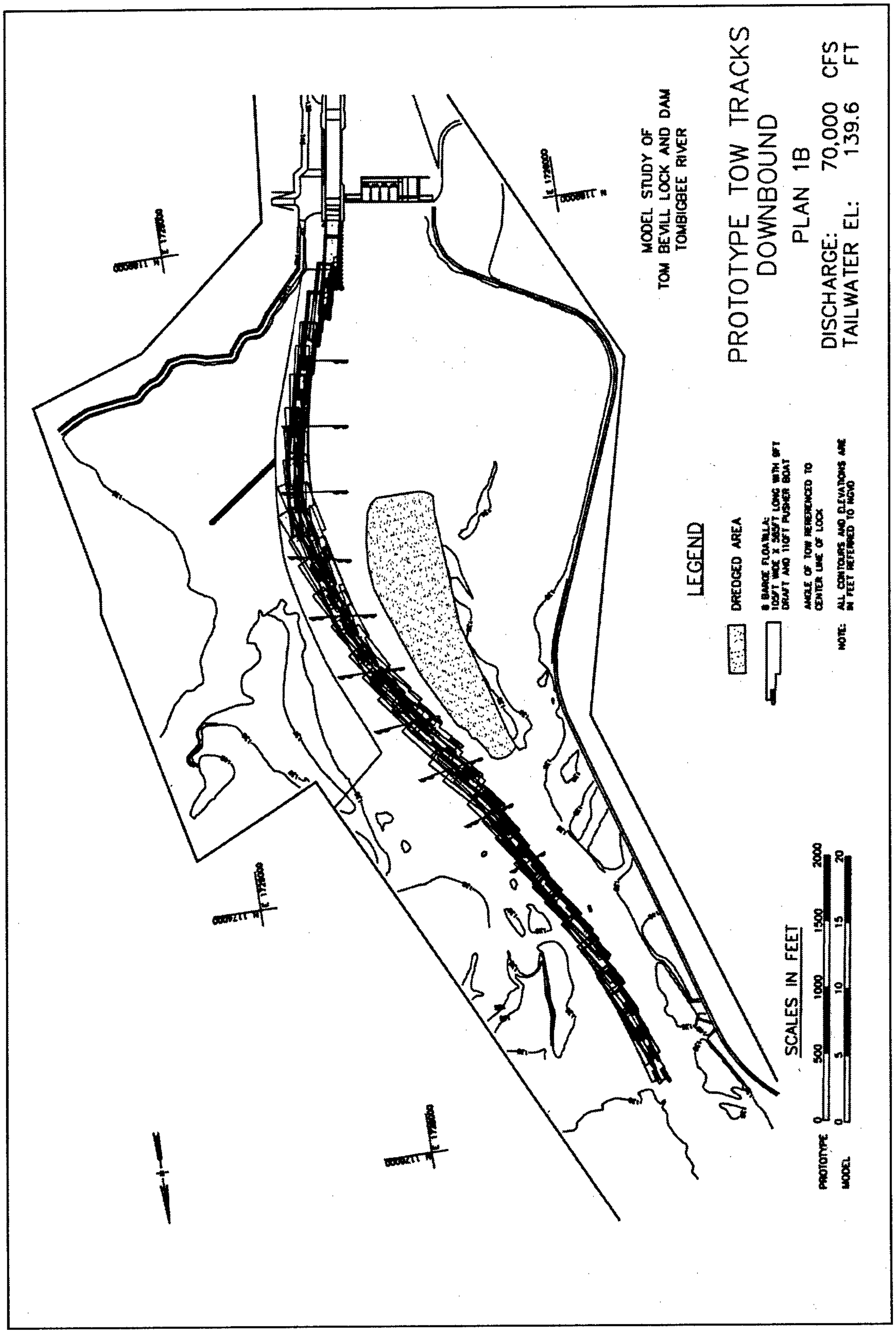
Plate 17


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
UPBOUND
PLAN 1
DISCHARGE: 70,000 CFS
TAILWATER EL: 139.6 FT
LEGEND
DREDGED AREA
8 BARGE FLOATILLA: 105FT WIDE X 585FT LONG WITH 9FT DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
DOWNBOUND
PLAN 1B
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT
LEGEND
DREDGED AREA
8 BARGE FLOATILLA: 105FT WIDE X 585FT LONG WITH 9FT DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20



MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
UPBOUND
PLAN 1B
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT
LEGEND
DREDGED AREA
8 BARGE FLOTILLA: 105FT WIDE X 385FT LONG WITH 9FT DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
DOWNBOUND
PLAN 1B
DISCHARGE: 70,000 CFS
TAILWATER EL: 139.6 FT
LEGEND
DREDGED AREA
8 BARGE FLOTILLA: 105FT WIDE X 585FT LONG WITH 9FT DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20

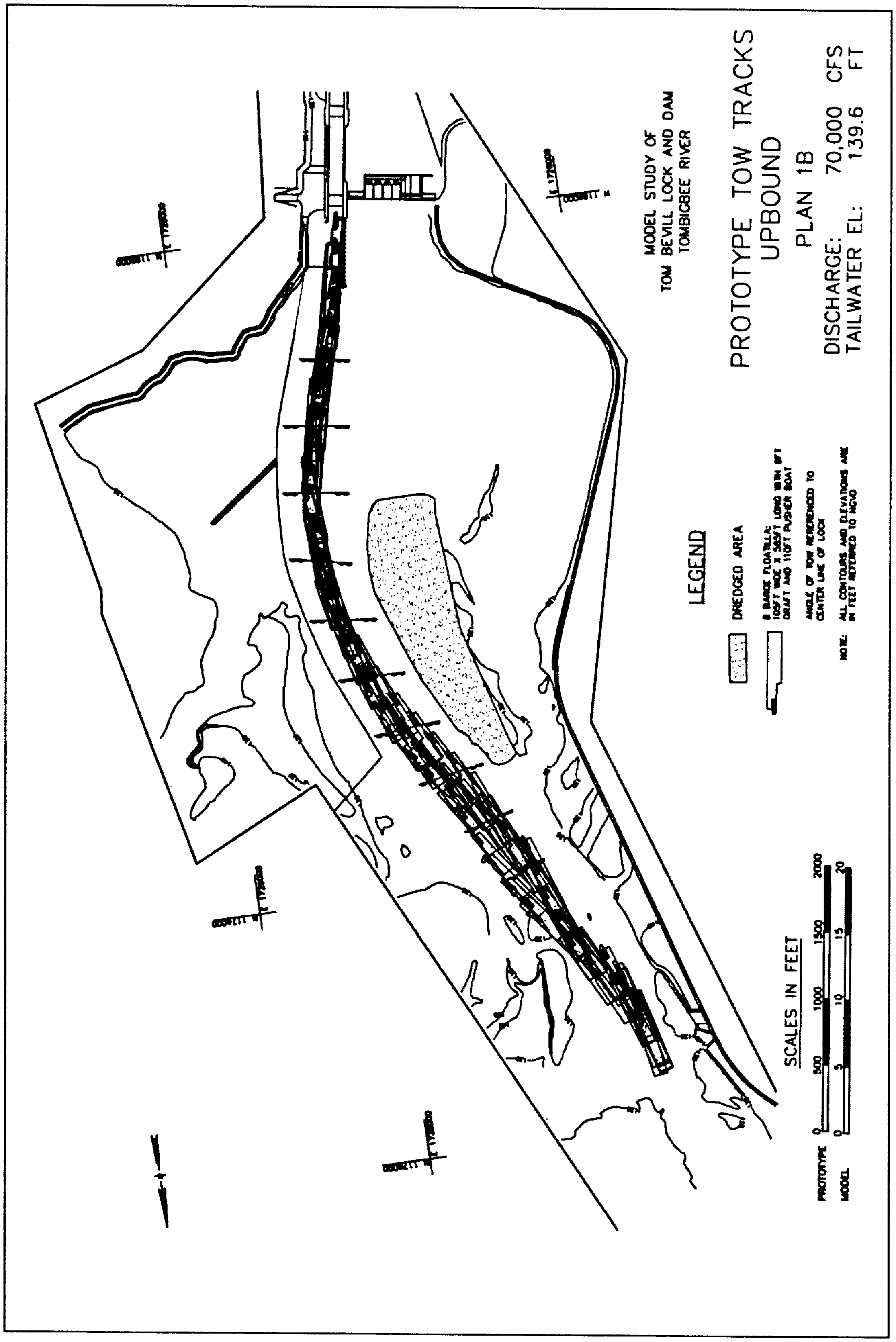
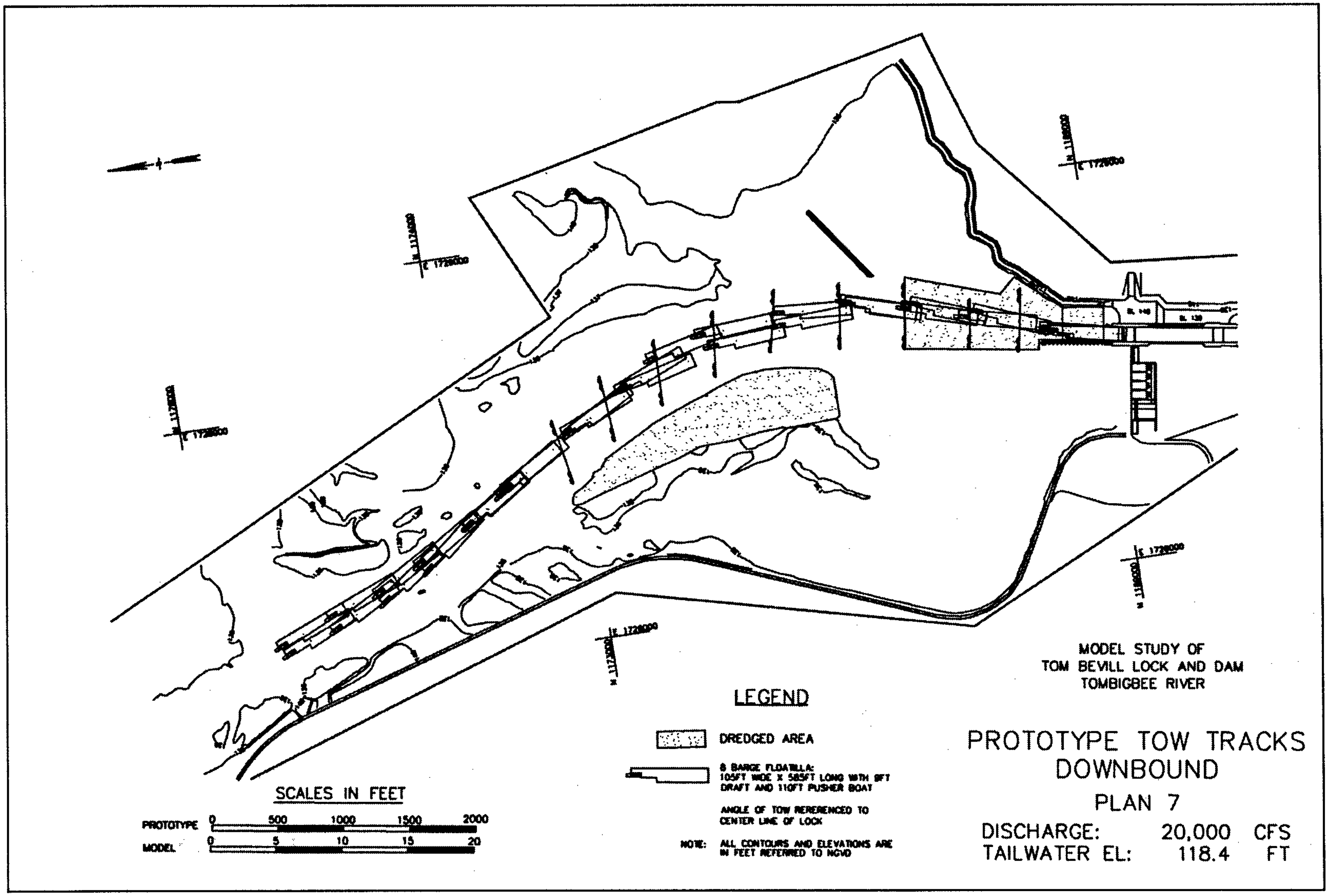

MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
UPBOUND
PLAN 1B
DISCHARGE: 70,000 CFS
TAILWATER EL: 139.6 FT
LEGEND
DREDGED AREA
ANGLE OF TOW REFERENCED TO CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20

Plate 22


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
DOWNBOUND
PLAN 7
DISCHARGE: 20,000 CFS
TAILWATER EL: 118.4 FT
LEGEND
DREDGED AREA
8 BARGE FLOTILLA: 105FT WIDE X 585FT LONG WITH 9FT DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20

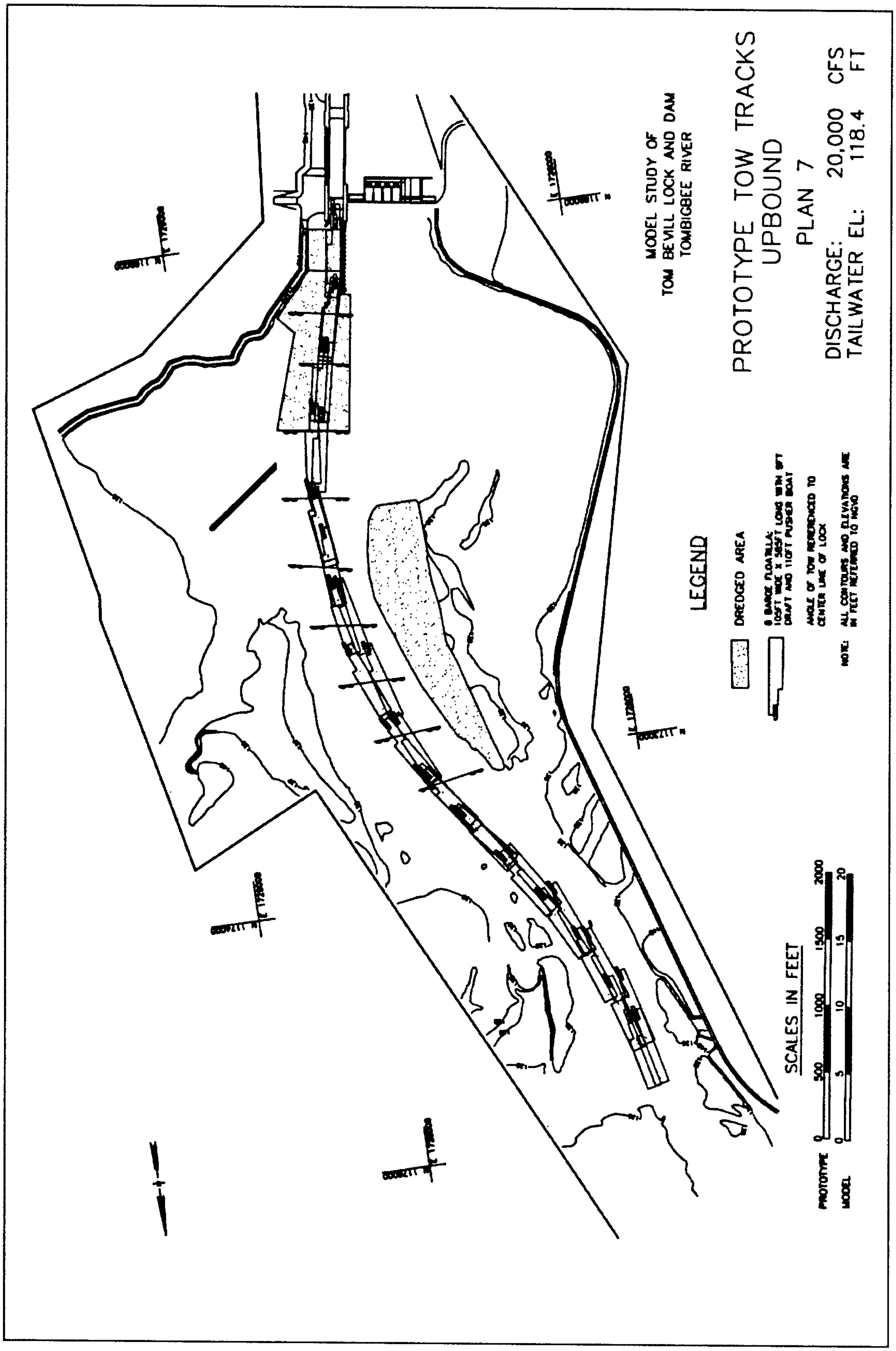
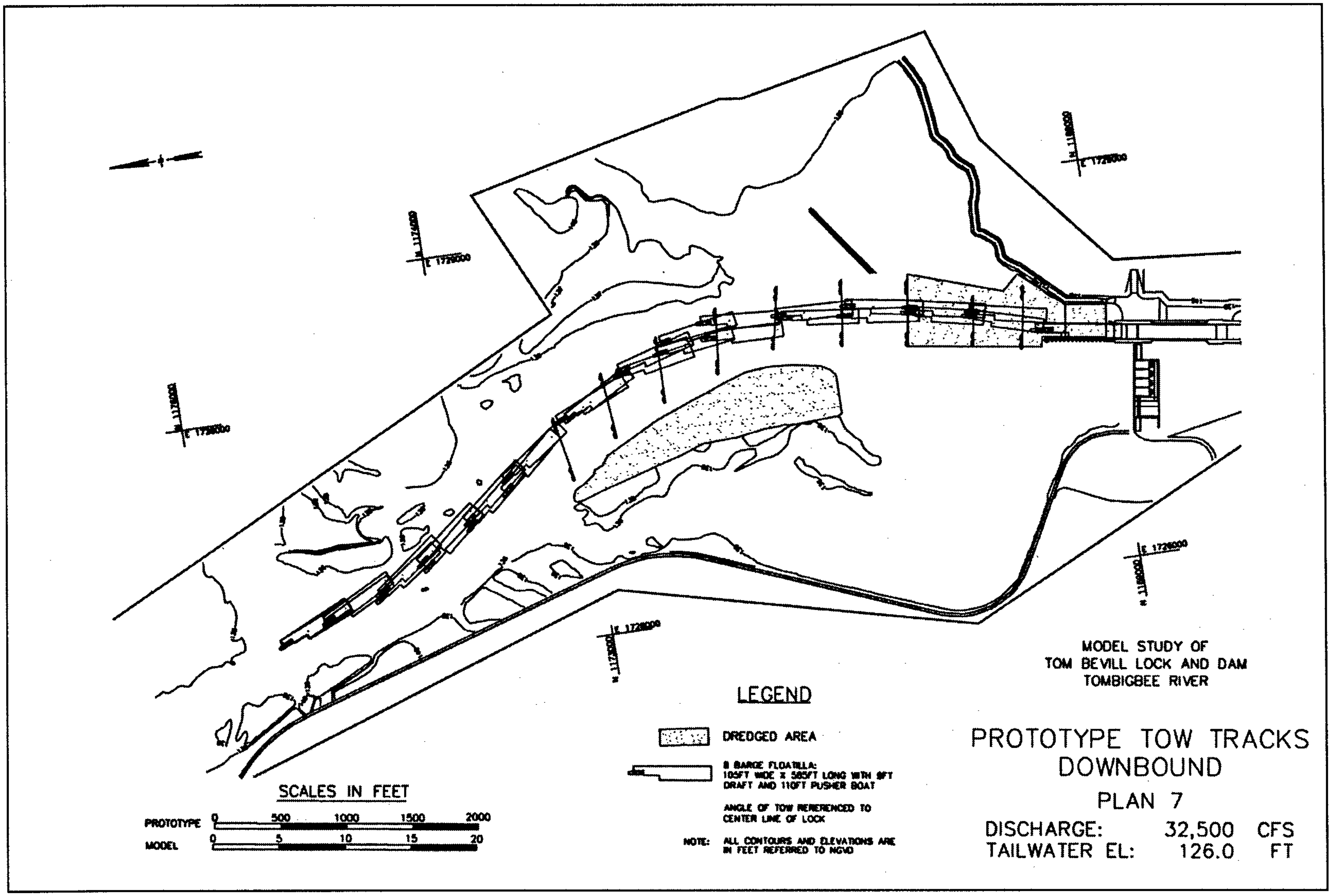
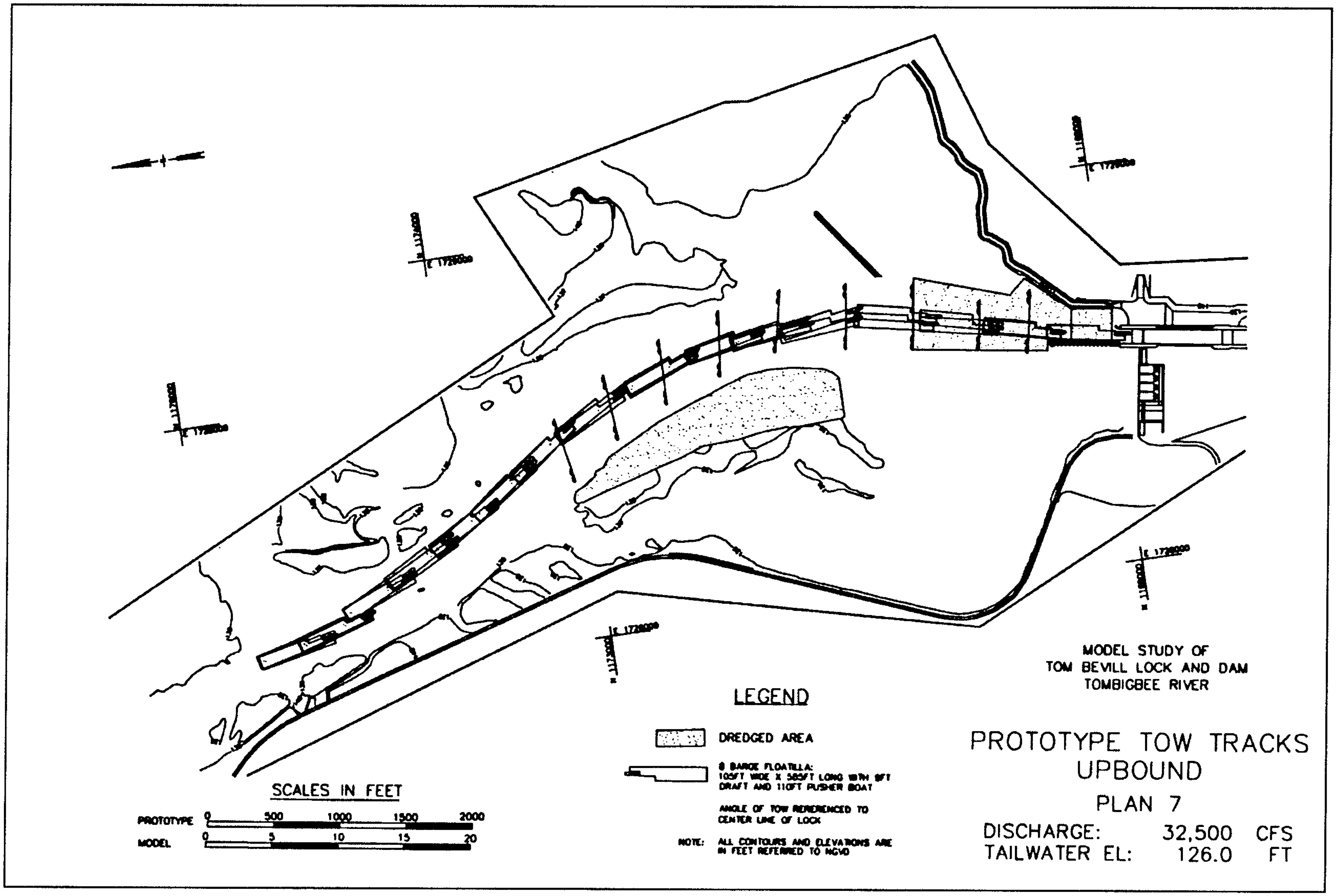
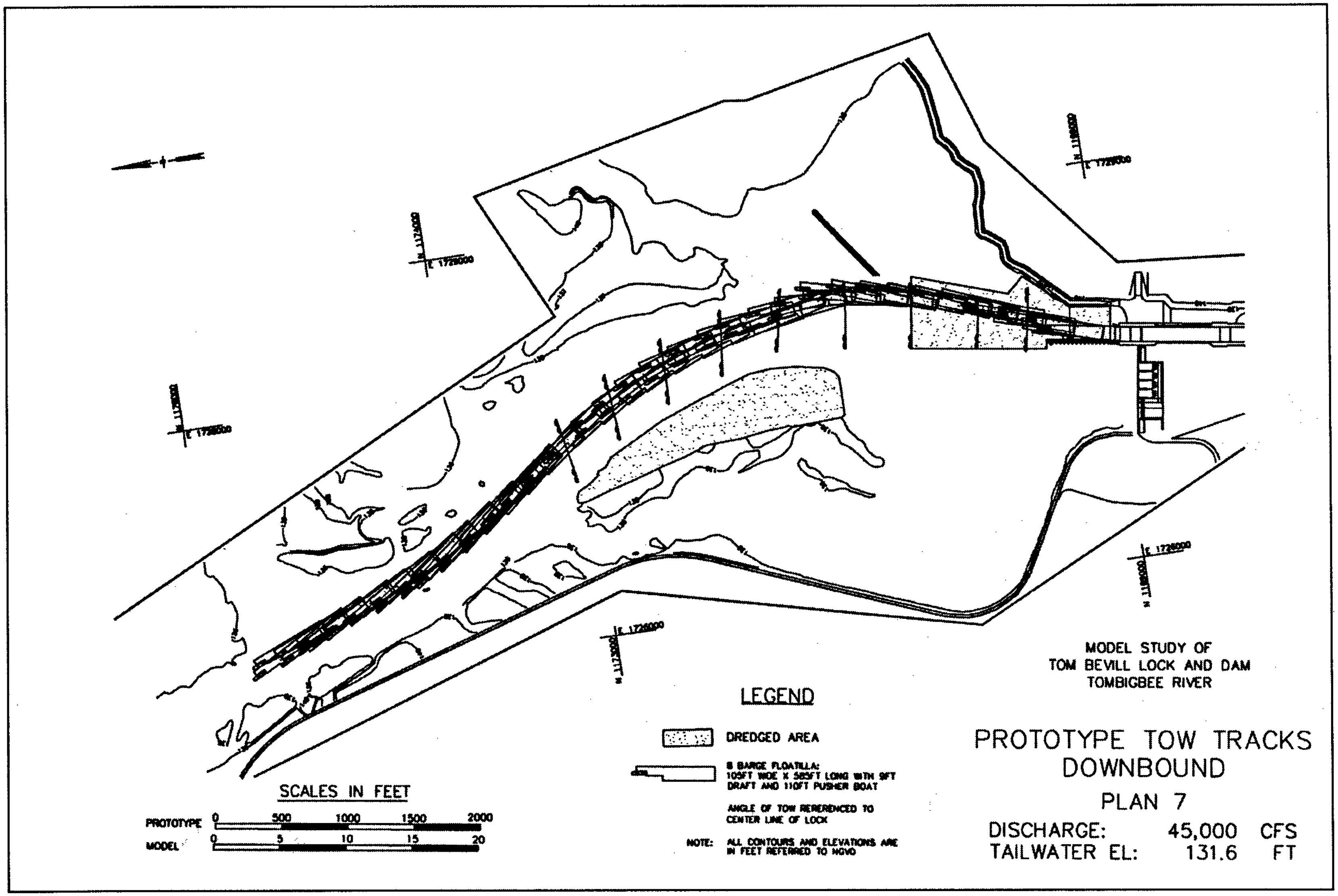
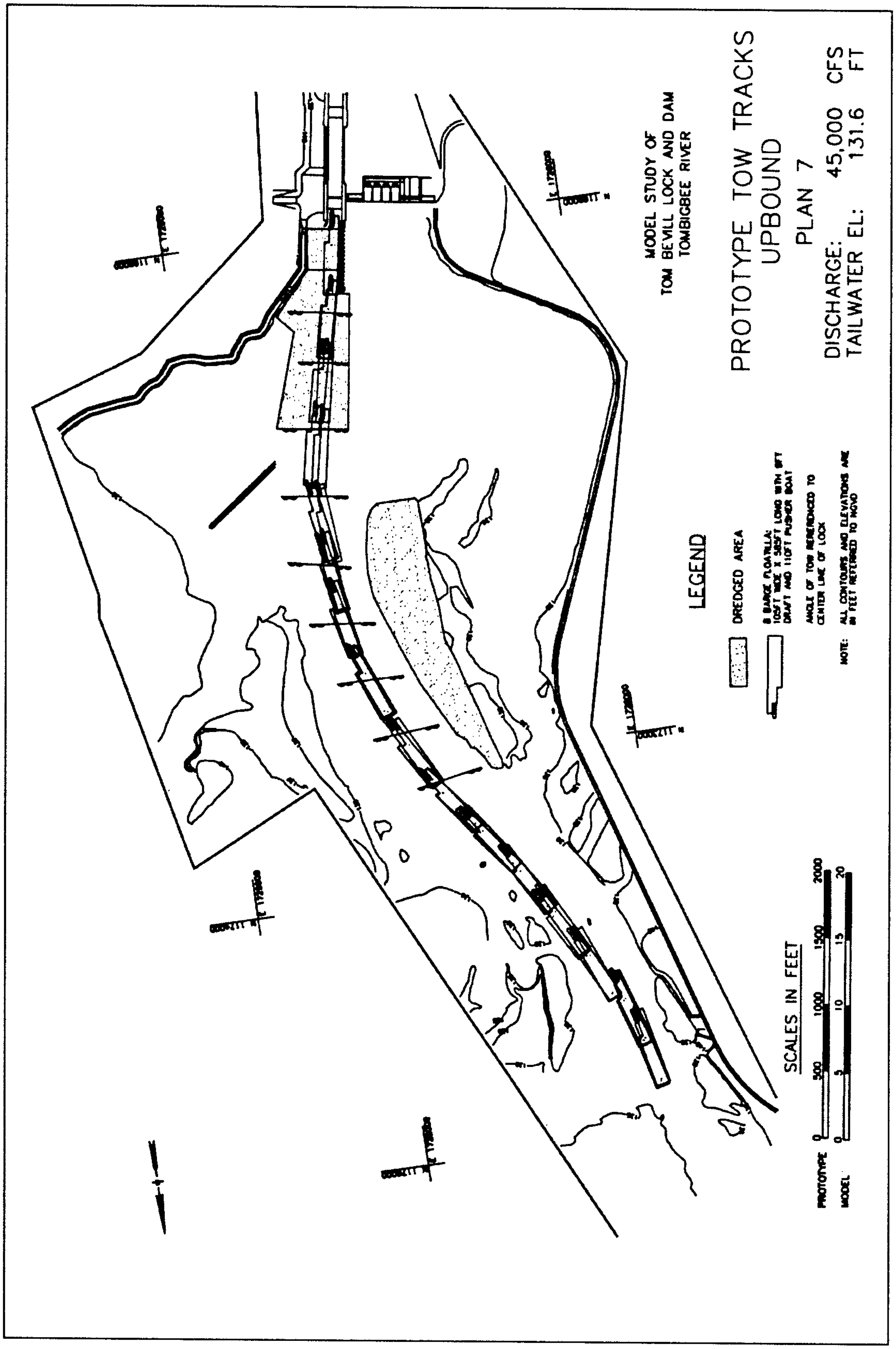

MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
UPBOUND
PLAN 7
DISCHARGE: 20,000 CFS
TAILWATER EL: 118.4 FT
LEGEND
DREDGED AREA
ANGLE OF TOW REFERENCED TO
CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE
IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20

Plate 24


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
DOWNBOUND
PLAN 7
DISCHARGE: 32,500 CFS
TAILWATER EL: 126.0 FT
LEGEND
DREDGED AREA
8 BARGE FLOATILLA: 105FT WIDE X 585FT LONG WITH 9FT DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20

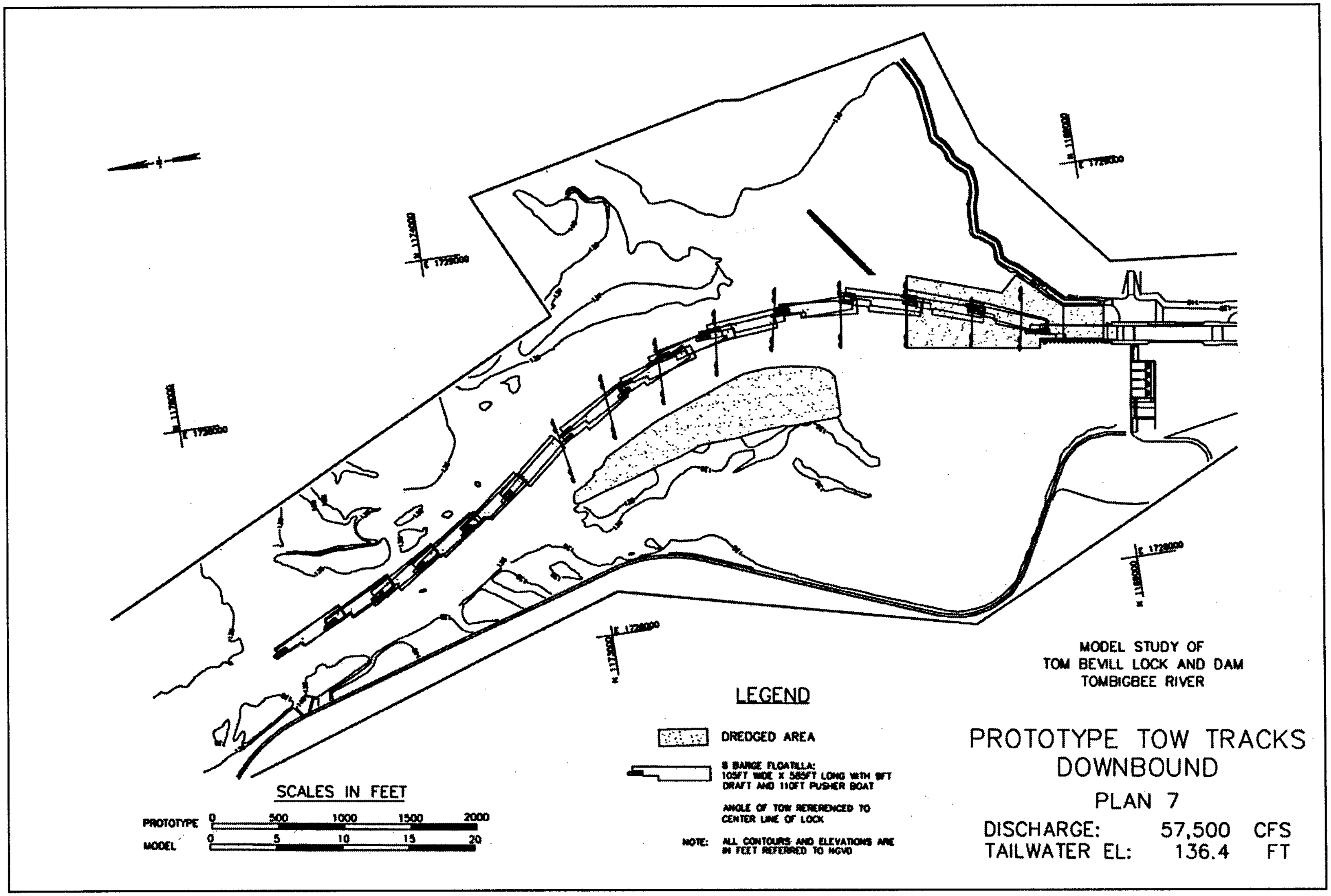

LEGEND
DREDGED AREA
8 BARGE FLOATILLA:
105FT WIDE X 585FT LONG WITH 9FT DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20
MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
UPBOUND
PLAN 7
DISCHARGE: 32,500 CFS
TAILWATER EL: 126.0 FT


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
LEGEND
DREDGED AREA
8 BARGE FLOATILLA:
105FT WIDE X 585FT LONG WITH 9FT
DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO
CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE
IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20
PROTOTYPE TOW TRACKS
DOWNBOUND
PLAN 7
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT



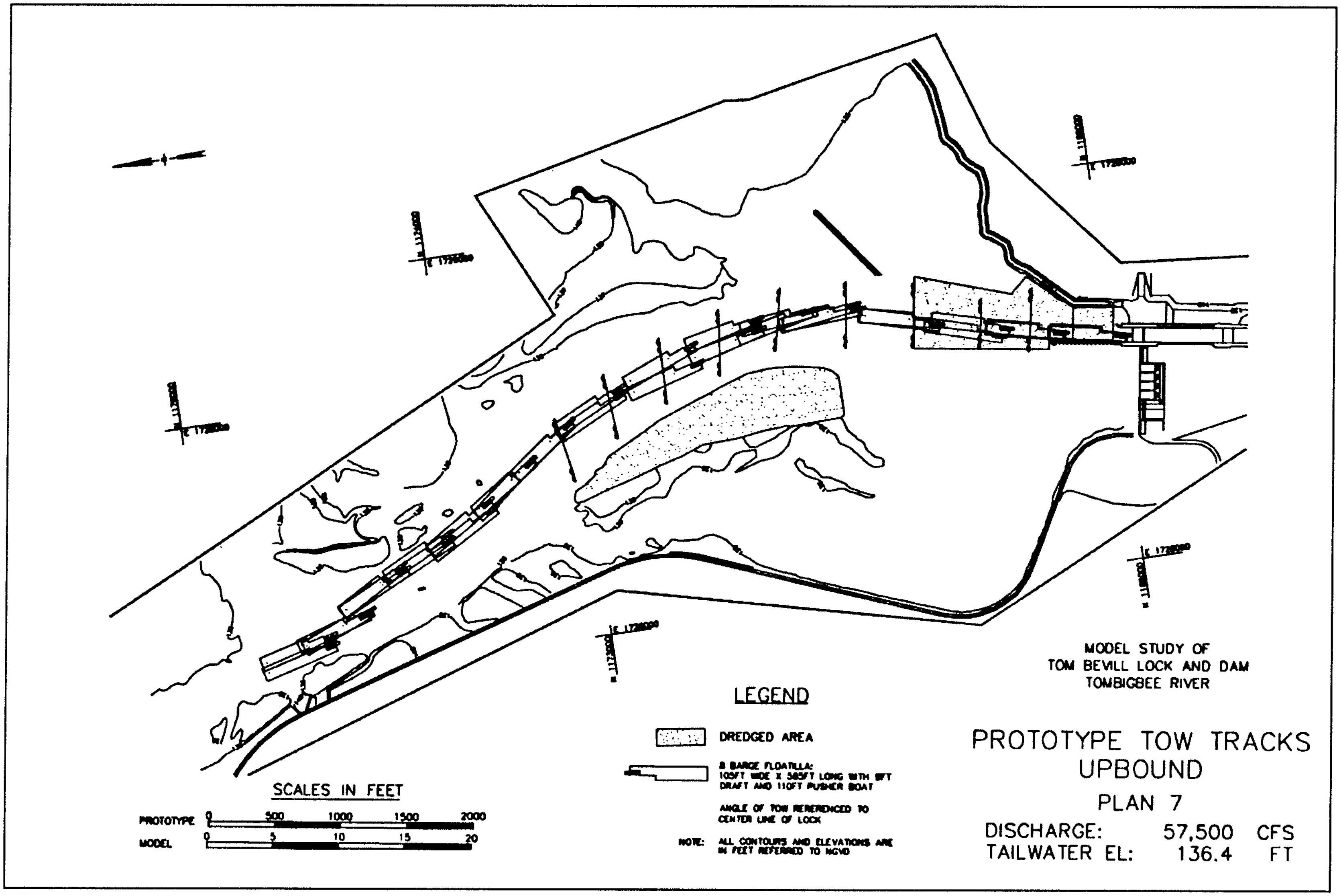
MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
UPBOUND
PLAN 7
DISCHARGE: 45,000 CFS
TAILWATER EL: 131.6 FT
LEGEND
DREDGED AREA
8 BARGE FLOATILLA: 105FT WIDE X 585FT LONG WITH 9FT DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20


Plate 28



MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
DOWNBOUND
PLAN 7
DISCHARGE: 57,500 CFS
TAILWATER EL: 136.4 FT
LEGEND
DREDGED AREA
8 BARGE FLOATILLA: 105FT WIDE X 585FT LONG WITH 9FT DRAFT AND 110FT PUSHER BOAT
ANGLE OF TOW REFERENCED TO CENTER LINE OF LOCK
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20


Plate 29


MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
PROTOTYPE TOW TRACKS
UPBOUND
PLAN 7
DISCHARGE: 57,500 CFS
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PROTOTYPE 0 500 1000 1500 2000
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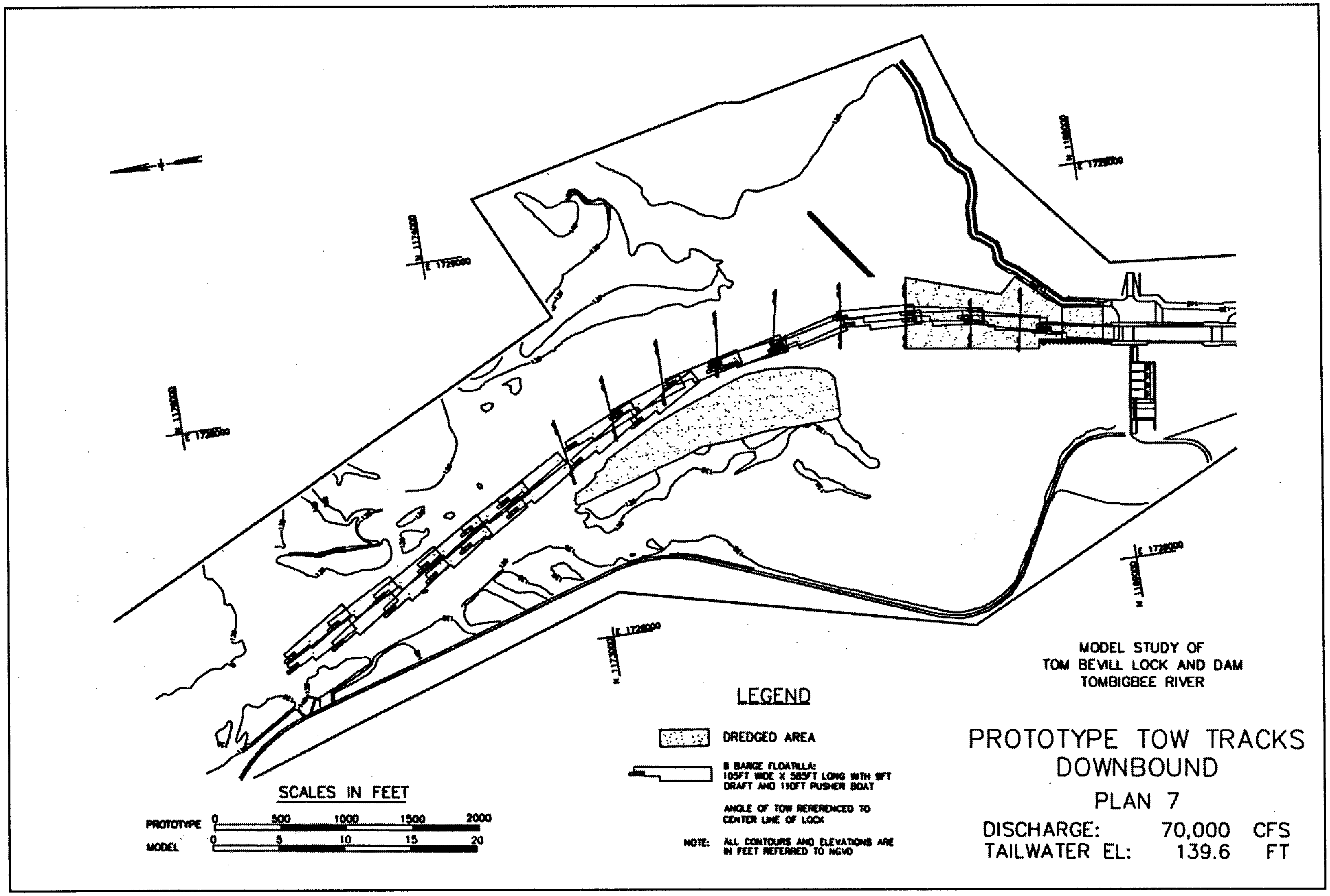

MODEL STUDY OF
TOM BEVILL LOCK AND DAM
TOMBIGBEE RIVER
LEGEND
DREDGED AREA
8 BARGE FLOATILLA: 105FT WIDE X 585FT LONG WITH 9FT DRAFT AND 110FT PUSHER BOAT
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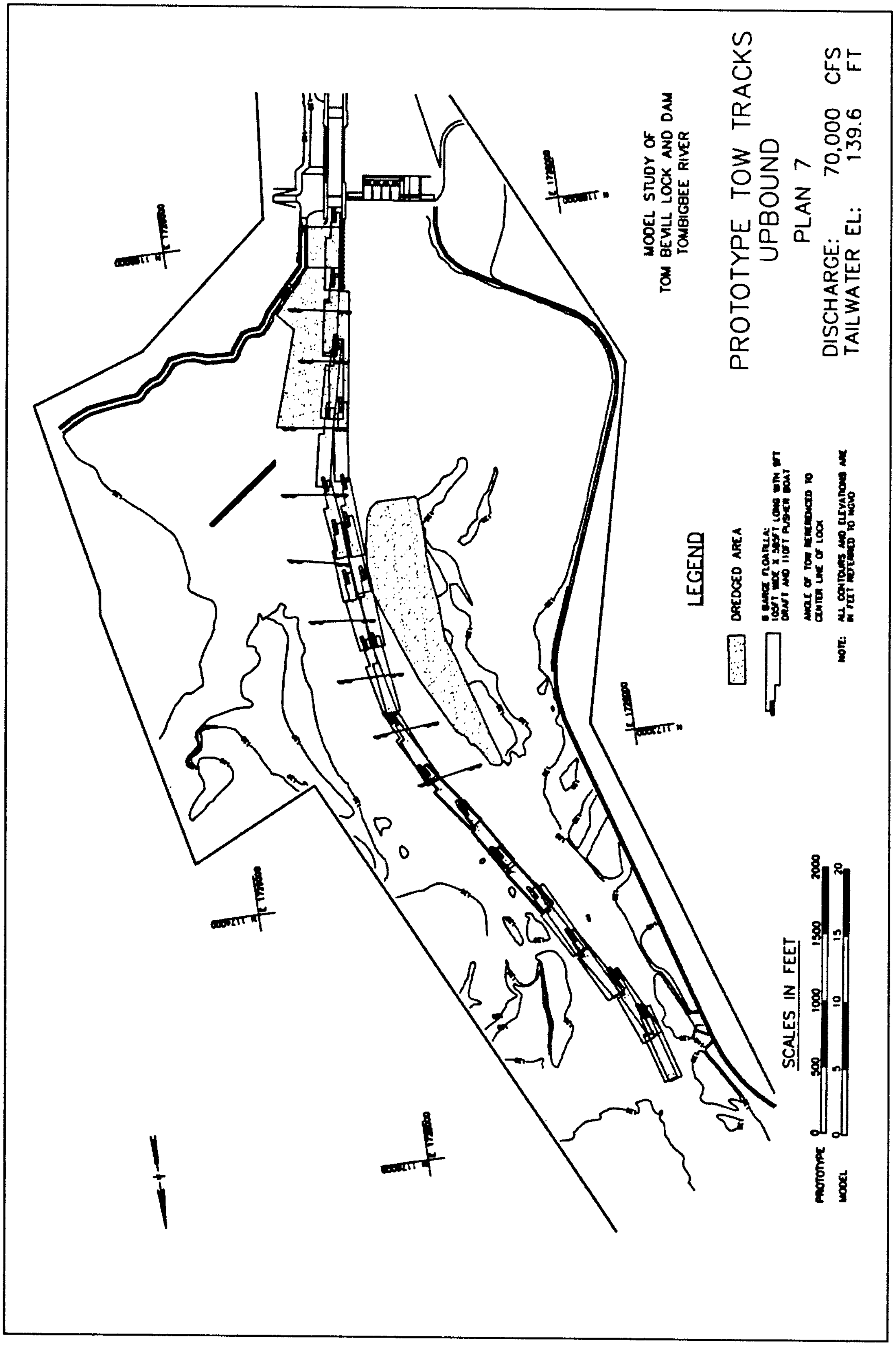
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD
SCALES IN FEET
PROTOTYPE 0 500 1000 1500 2000
MODEL 0 5 10 15 20
PROTOTYPE TOW TRACKS
DOWNBOUND
PLAN 7
DISCHARGE: 70,000 CFS
TAILWATER EL: 139.6 FT


Plate 31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PROTOTYPE TOW TRACKS
UPBOUND
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DISCHARGE: 70,000 CFS
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MODEL 0 5 10 15 20

Plate 32

# REPORT DOCUMENTATION PAGE

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|---|---|---|
| September 2003 | Final report | |

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Tom Bevill Upper Lock Approach, Tennessee-Tombigbee Waterway, Alabama: Hydraulic Navigation Investigation

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**5b. GRANT NUMBER**

**5c. PROGRAM ELEMENT NUMBER**

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**13. SUPPLEMENTARY NOTES**

**14. ABSTRACT**

The Tom Bevill Lock and Dam is approximately 1 mile southwest of Pickensville in Pickens County, AL. The lock is located on the left overbank about 332.7 river miles above the mouth of the Mobile River and is designed to maintain a minimum upper pool extending upstream to river mile 342.2 during low flows. The lock is 110 ft by 600 ft clear chamber dimensions. The dam consists of a gated spillway in the river channel and an adjacent 150-ft overflow weir on the right overbank. The lock is connected to the dam with a 150-ft abutment wall. A strong crosscurrent or outdraft existing in and around the upstream lock entrance causes difficulty for tow traffic navigating the lock. The purpose of the model study is to suggest possible solutions to improve and/or correct the outdraft for the approach of tows.

**15. SUBJECT TERMS**

| | | |
|---|---|---|
| Bendway wiers | Dike | Tom Bevill |
| Dam | Lock | |
| | Outdraft | |

| **16. SECURITY CLASSIFICATION OF:** | | | **17. LIMITATION OF ABSTRACT** | **18. NUMBER OF PAGES** | **19a. NAME OF RESPONSIBLE PERSON** |
|---|---|---|---|---|---|
| **a. REPORT** | **b. ABSTRACT** | **c. THIS PAGE** | | | **19b. TELEPHONE NUMBER** *(include area code)* |
| UNCLASSIFIED | UNCLASSIFIED | UNCLASSIFIED | | 58 | |